AVIATION WEEK

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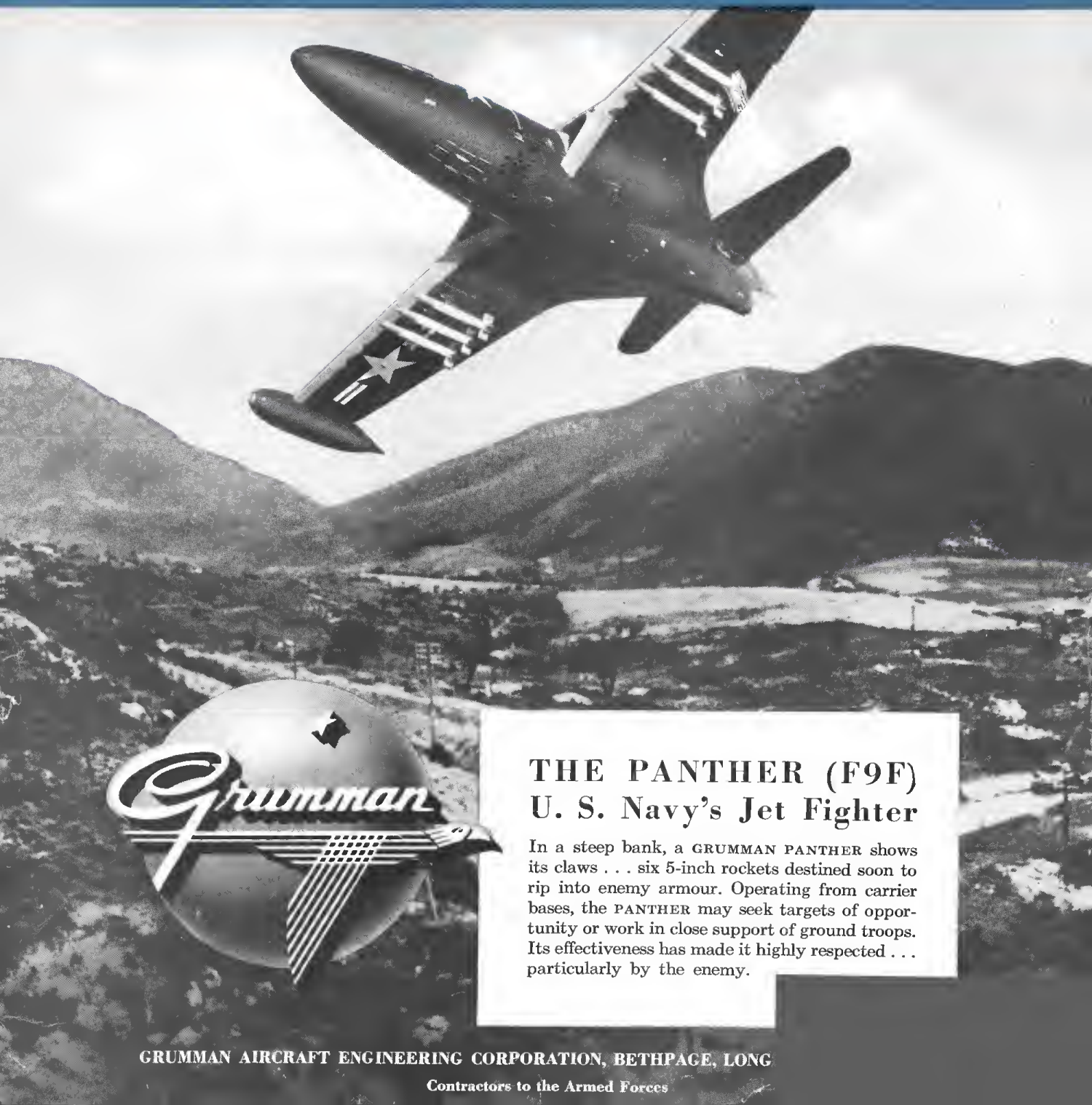

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THE PANTHER (F9F)
U. S. Navy's Jet Fighter

In a steep bank, a GRUMMAN PANTHER shows its claws . . . six 5-inch rockets destined soon to rip into enemy armour. Operating from carrier bases, the PANTHER may seek targets of opportunity or work in close support of ground troops. Its effectiveness has made it highly respected . . . particularly by the enemy.

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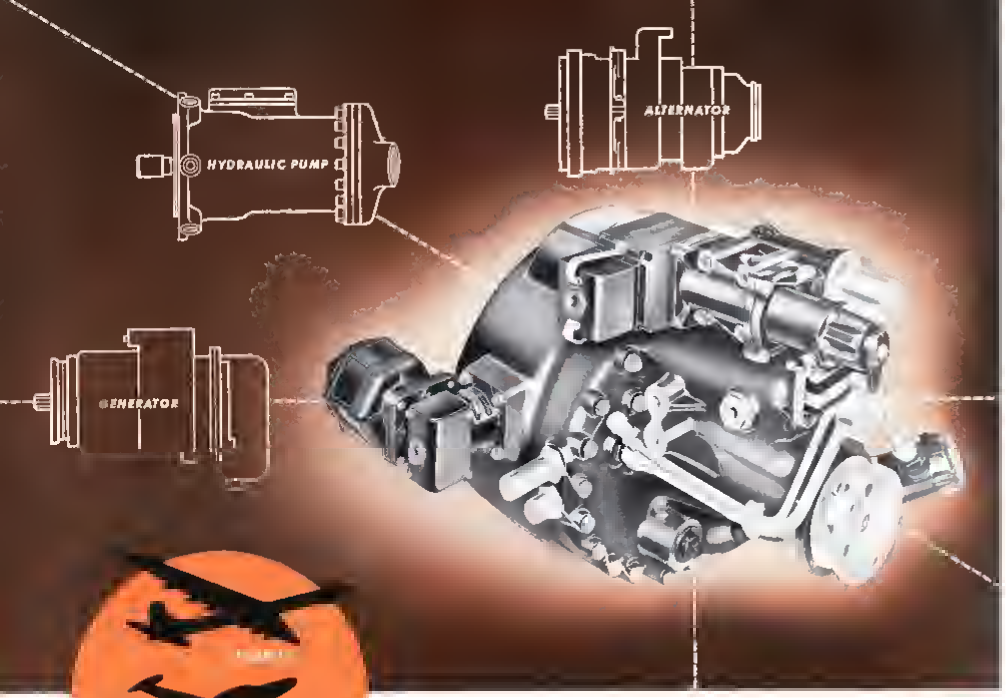

The *constant speed* transmission that helps solve accessory drive problems

To meet the rapidly expanding need for constant speed accessory drives, Sundstrand is now prepared to adapt its famed B-36 alternator drive to your requirements. With it, you can plan on greater use of AC power . . . conform to exacting new design requirements . . . save considerable weight in wiring and in accessories such as hydraulic pumps and generators. Sundstrand drives control speed to plus or minus ½ of one per cent. Normally they are driven from the engine pad at speeds of approximately 3,000 to 9,000 rpm, delivering full power and constant speed over this range of input speeds. Available in close coupled or split system types. Special adaptations can be developed for you through Sundstrand's *reliable* research, *expert* engineering, and *precision* production.

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B.F.Goodrich

How to keep a fighter from blowing its top

THE NORTH AMERICAN F-86 Sabre has a pressurized canopy, with a rubber seal between the canopy top and the fuselage. High altitudes used to raise hob with this inflatable seal. Under the severe effects of high pressure on the inside, low pressure on the outside, it blew out.

B.F.Goodrich engineers tackled the problem, came up with a new idea in inflatable seals. They took knitted fabric, rubber-coated inside and out, and cured it to a soft rubber base. Under pressure this rubberized fabric (slack before inflation) increases the size of the seal many times, with almost *no stretching* of the rubber.

As a result, it's like blowing up a paper bag instead of a toy balloon. The new seal inflates easier, with lower pressures—giving far greater protection against high altitude blowouts. It inflates with less pressure at *minus* 65°F than the old-type seals required at *room* temperatures!

The BFG inflatable seal fits complex curves. It's more adaptable, tougher, more damage-resistant. Sealing and unsealing action is faster. Sliding wear and scuffing are minimized.

The new seal has proved so superior that it has been adopted by the F7U, Banshee, B-45 and other planes as well as the F-86. In each case, it is tailored to the design.

If you have a sealing problem—or any other that rubber might solve—get in touch with B.F.Goodrich, leader in rubber research and engineering. *The B.F.Goodrich Company, Aeronautical Division, Akron, Ohio*

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LEAR, INCORPORATED

12 YEARS

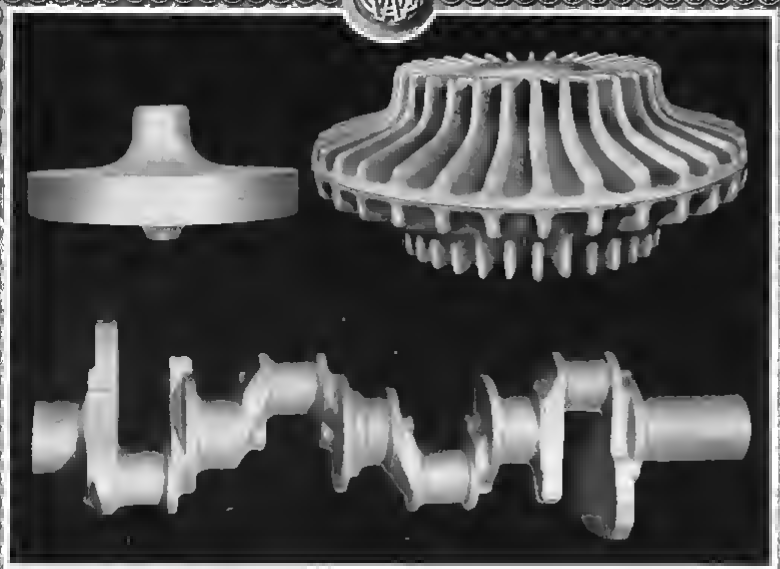
FAFNIR

Hailed as the "guts and core of America's air defense", Lear's recent contribution to aviation—the light weight F-5 Automatic Pilot—is a triumph of miniaturization as well as ingenuity. Its extreme compactness puts extraordinary demands on ball bearings. Significantly, Fafnir Instrument Ball Bearings are used. For over 12 years, Fafnir has been working closely with Lear, Incorporated. Something more than good ball bearings maintains this long association. It's a Fafnir attitude and aptitude . . . a way of looking at ball bearings from the designer's side, an aptitude gained from more than forty years' specialization in ball bearings. The Fafnir Bearing Company, New Britain, Connecticut

Fafnir Extra-Small Bearing, one of the Fafnir Ball Bearings regularly specified for Lear Incorporated precision aircraft equipment. A new catalog listing a wide range of

sizes suitable for instrument applications is available. In requesting a copy, please use your company letterhead

Illustration of bearing is twice size



Wyman-Gordon— specialists in the vital forgings of the internal combustion engine since its inception—is today the largest producer of crankshafts for the automotive industry and of all types of forgings for the aircraft industry. Be it crankshafts and other vital forgings for the piston type engines or turbine wheels and impellers for turbo jets—there is no substitute for Wyman-Gordon experience.

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NEWS DIGEST

DOMESTIC

Convair Turboliner has made a two-hour flight in the third of its series of flight testing. Flying is being conducted at Brown Field near Chula Vista.

Armand J. Thieblot, chief engineer at Fairchild's Aircraft division, Hagerstown, has resigned. He may join his brother-in-law who heads the Gassner Aircraft Engineering Co. in New York City.

Shipments of civil aircraft, measured in airframe weight, came to 502,700 lb. in December 1950, with shipments for the entire year, other than to U. S. military customers totaling 5,924,000 lb., a decrease over 1949, when 6,744,400 lb. were shipped to other than U. S. military customers. Civil engine shipments during December 1950 came to 191,300 hp., with civil shipments for the entire year being 1,646,000 hp., an increase over 1949's total of 1,231,500 hp. Airframe plant employment last December 1950 was 222,091 against November's 211,864. Engine plant employment in Dec. 1950 was up to 50,638 from November's 48,274.

Robert H. Purcell, assistant treasurer and controller of Western Air Lines, died at his home in Los Angeles at the age of 55. He joined WAL in 1947, was with Continental Air Lines from 1939 to 1947.

Defense procurement rate more than double during January over the previous six months average. At the end of January 1951, total obligations for major procurement by the military departments came to $16.4 billion, compared with the six months total ending Dec. 31, 1950 of $12 billion. Of the seven months total, USAF obligated $6.7 billion, Navy $3.4 billion and Army $6.3 billion. Included in the total was $1 billion for MDAP.

Exports of Personal and Executive planes of 6000 lb. and less, empty airframe weight, for February by nine companies came to 32 planes valued at $153,408, compared with 49 planes valued at $188,826 the previous month.

More than 18,000 Convair-Ft. Worth employes represented by IAM have won a six-percent hourly pay boost, retroactive to Nov. 20, 1950. All 27,000 workers at the division now have the six percent pay boost. A similar pay increase was recently granted employes of the company's San Diego Division.

FINANCIAL

Texas Engineering & Manufacturing Co. has declared its regular quarterly dividend of five cents per share on common payable Mar. 31 to holders of record Mar. 23.

Capital Airlines has completed redemption of its 4 percent Series B convertible debentures, with 99 percent of these debentures surrendered for conversion into 243,858 shares of the airline's common stock. Of a total amount of $2,728,500 in debentures, all but $19,000 were submitted for conversion. Total debenture debt of Capital has been reduced to $3,157,500.

Seaboard & Western Airlines of New York, has voted a 25-percent stock dividend payable Apr. 30, to stockholders of record Apr. 19.

INTERNATIONAL

Royal Navy will get jet fighters in squadron service this year, including the Supermarine Attacker, Hawker Sea Hawk and Westland Wyvern. The new 36,800 ton carrier Eagle will be commissioned this summer. Royal Navy now has 12 carriers in service, against 11 during the wartime peak. On completion of its present program, RN will have 18 carriers. On order with Royal Navy are the Fairey 17 turboprop antisub plane and the de Havilland Venom 2-place night fighter.

Substantial orders for the CF-100 Canuck jet fighter have been placed by the Canadian government, states C. D. Howe, Minister of Trade and Commerce. He intimated that the U. S. and other NATO nations are expected to order the Avro Canada plane. With some 370 firms to be utilized in CF-100 and Orenda jet engine production, output is expected at 20 planes monthly.

A THAI airliner crashed into Mt. Parker near Hong Kong shortly after takeoff from Kaitak Airport, killing all 24 aboard. The four-engined plane was owned by Pacific Overseas Airways.

Two special international courses for overseas engineers in design and application of gas turbines for all purposes are to be held this summer at Britain's School of Gas Turbine Technology at Farnborough, Hampshire. First course begins May 27, the second Sept. 16. Each will last three weeks. The school is administered by the British government owned Power Jets (Research and Development) Ltd.

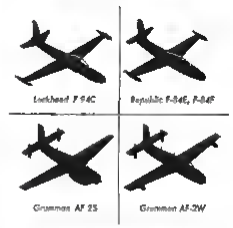
The ROTORette approaches the ultimate in simplicity for a two-position rotary actuator because of its unique load-sensitive feature.

Motion is controlled *positively* by adjustable mechanical limit stops. The adjustable load-sensitive limit switches are de-energized whenever the actuator either reaches the limits of mechanical travel or encounters the maximum permissible load. This construction provides two essential characteristics for dependable operation of valves, dampers, etc., up to 50 inch-pounds maximum operating load:

1. Accurate positioning of the driven device.
2. Elimination of damage from overtravel or overload.

See condensed literature in 1951 I.A.S. Aeronautical Engineering Catalog or write for Bulletin 118.

***ROTORette* is currently used on these planes**



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SIDELIGHTS

Congress

House Appropriations Committee's proposal to give the Postmaster General authority to stop over-costly domestic mail service and ship mail by "more economic means" will probably be turned down by the Senate, even if it passes the House. The proposal is directed at the Chicago Helicopter Service, which PO says costs $300,000 more a year to operate than with trucks.

Air Force

USAF, short of second lieutenants, said it will order to active duty all AF ROTC students graduating from college this year—about 8100.

The Press

Marquis Childs in his column May 15 said: "If Democrats & Republicans really mean to investigate the influence in dustry in Washington in its higher ramifications let them go on to the CAB. They will find a case ready-made for them in the American Overseas Airlines merger with Pan American Airways. Of course, if such an investigation wanted to turn to a little history, it could dig into how the European air routes were awarded after World War II, who exerted the influence there and who got paid. Here are the big prizes on the political bargain table."

Airlines

A group of large irregular carriers belonging to the Air Coach Transport Assn. plans to press the D. C. Circuit Court of Appeals for an injunction to block the CAB's amendment to Part 291 of the economic regulations. The amendment limits the nonskeds to three trips a month between any two big cities. It's effective Apr. 6.

Military Equipment

Air Materiel Command runs tractor tread tests on a B-50B to round its data on the subject. Others in these tests are B-36 and C-82. . . AMC's new **Armament Test Center** is at Eglin AFB, Fla. . . . The 21-ft., 13,000-lb., Bell-built **Tarzon bomb** is getting its battle test in Korea. The USAF developed free-falling guided missile is controlled during descent by a bombardier using a computer and gunsight to keep the image of the bomb superimposed on the target. By remote electronic control, bombardier can correct deviation of the bomb on its path to target. . . **Wingtip tanks** used by four North American RB-45C jet bombers on their recent 4600-mi. trip from Shreveport to Manston RAF station in England hold 1200 gal. each and are described as the largest fitted externally on any plane. AMC announces a new **combination rifle-shotgun** developed by Army Ordnance Corps for stranded airmen. It's the M-6 over-and-under .22 calibre Hornet rifle and .410 gauge shotgun, weighing 3 lb. carrying ammunition within the stock, which folds. It will be part of the AF's survival kit. **Lockheed F-94C** (ex F-97) will have the

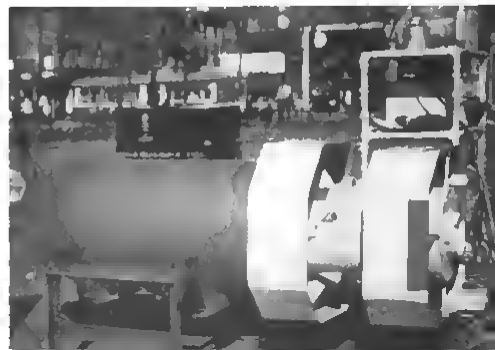
(Continued on page 19)

SABRE FORE AND AFT—Two detailed views of the nose and tail of the North American F-86 show oval inlet for the GE J-47 turbojet which can be seen deep in the fuselage, and the exhaust outlet. Rear view also shows extended fuselage dive brakes.

Military Aviation Picture Highlights

HOME AWAY FROM HOME—English Electric chief test pilot Wing Cmdr. Roland Beamont expertly demonstrates the Canberra's agility before officials and engineers at the Glenn L. Martin plant in Baltimore which will build the twin-jet light bomber and intruder for the USAF. Beamont, who has done the major part of the flight testing of the speedy craft, came to the U. S. especially to fly the plane. An RAF crew flew it across the Atlantic for showing to USAF officials (Aviation Week Mar. 5).

BUILDING THE BIG ONES—A portion of B-36 production (below) at Ft. Worth, showing nose, forward fuselage and tail sections being made and assembled.



MISSILE ACCOMPLISHED—Squat VB-3 Razon (radio-controlled azimuth and range) bomb has a colored flare in the tail to permit visual correction by bombardier.

INDUSTRY OBSERVER

► Jet helicopter rotor systems are coming fast. First practical operational one may be the McDonnell three-blade jet rotor shipboard copter designed for the hotly contested Marine competition. It was one of the two winners. It is to carry crew of two, plus passengers and litters or cargo. Another jet-powered newcomer is a convertaplane testbed made from a lightplane and essentially a jet-rotored autogiro, except that its rotor will not be used for level flight, just ascent and descent. It will probably fly near Philadelphia sometime this summer.

► Powerful little Armstrong Siddeley Viper turbojet has been named as the powerplant for an Australian radio-controlled pilotless aircraft. It produces 1500 lb. thrust but weighs only 400 lb. and has 20 in. diameter.

► Despite the planes' beat-up condition, hot buying competition is expected at Oklahoma City for CAA's sale of Douglas C-54A Serial No. 3058 and C-54B Serial No. 2733, since C-54s are hard to get nowadays. Bids must be in by Apr. 3. Bid Invitation 5567, available from CAA in Washington, tells the story. A two-year restriction against exporting the planes is aimed at keeping their airlift capacity available to this country in emergency at least for that period. CAA is keeping its four best C-54s for training of safety agents and for Pacific island service.

► Tests mounting a 75mm. recoilless rifle on an L-5 liaison plane (AVIATION WEEK Mar. 19, p. 18) at Army's Ft. Sill, Okla., Artillery School have been discontinued with the conclusion that mounting and firing of the 75 mm. gun is not practical on that type of aircraft.

► English Electric Canberra two-jet light bomber and intruder plane, to be built in this country by Glenn L. Martin Co., has been designated the B-57A by the USAF.

► Ryan Super Navion operated by U. S. Forest Service out of San Francisco has a special 18 by 22 in. door in the floor of the baggage compartment for making aerial drops, reseeding, and photography.

► Bristol Hercules engines used on BOAC's fleet of Hermes IV transports are to be modified to take a Vee-tod installation. Modification is designed to make possible operation at lower rpm., and at higher boost at the same time avoiding strain on connecting rods. Bristol expected the modification to boost the Hermes IV cruising speed to nearly 260 mph. tas. at 20,000 ft., compared to present figure of 222 mph. at 13,000 ft.

► North American sources say that decision of the British to purchase the F-86 Sabre fighter in quantity followed a series of secret dogfights in England between two F-86s and Britain's best operational fighters—Vampires and Meteors—in which the British fighters were definitely outmatched.

► Whether or not the CAA-certificated Fulton Airphibian roadable plane goes into production will depend on military orders. Robert Edison Fulton, Jr., the inventor, has his production jigs ready and about enough material ready for 15 to 20 Airphibians, at Danbury, Conn. But he won't start production until he determines the military market. With military services asking CAA certification prior to evaluation of commercial types, the Airphibian has an edge in this respect on the other two roadable planes in this country that have flown recently—the Taylor Aerocar and the Hall Flying Auto.

► Convair's new 340 will have its entrance stairway for passengers on the lefthand side of the fuselage in front of the wing, instead of on the righthand side, as in the 240, due to individual airline requirements.

► Fairey Aviation Co. is developing a two-jet copter, which it claims can be in production by 1953-54. Separate jet units will give added takeoff or landing thrust. The Rotodyne is designed to carry 23 passengers at 135 mph.

WHO'S WHERE

Changes

G. D. McVicker has been made Convair Liner 340 project manager and will handle all phases including engineering, production and deliveries of the plane. He has been project engineer on the 240 since 1945. At Ft. Worth, Convair has promoted **A. P. Higgins** to the newly created position of development manager to work on the B-36.

G. B. (Jerry) Clark, who is marking his 25th year in aviation, has been made director of helicopter contracts for Bell Aircraft's new Helicopter division, which has moved into new quarters at Kenmore, N. Y. **Edwin J. Ducayet** was named assistant to **Harvey Gaylord**, vice president in charge of the division, and **Matthew R. Barcellona** is manager of industrial engineering.

L. T. Callahan has been appointed manager of operations of General Electric's Aircraft Gas Turbine divisions at Lynn and Everett, Mass. **Dr. S. W. Herwald** has been appointed manager of Westinghouse Electric's engineering development division and **P. L. Fosburg** is manager of the engineering design division. New section managers are: **R. E. Span**, analytical, **C. E. Bagwell**, autopilot, **G. F. Towner**, turret systems, **H. M. Watson**, electromechanical, and **N. V. Petrou**, computing devices. **H. D. Lawton** has been made engineer in charge of design of fixed gunfire control systems.

G. O. Hagland, formerly with Frederic Flader, has been named assistant director of General Mills' Aeronautical Research Laboratories. **James R. Smith** has joined the organization as project engineer on the firm's plastic, high-altitude balloons ("flying saucers"). **Vic N. Thacker** has been appointed production manager of Electrol, Inc. **Jack C. Zippwald** has been promoted to assistant director of customer service at Ryan Aeronautical.

Joseph D. Ryle has been appointed director of public relations for American Airlines, filling the vacancy left when **Ben Wright** resigned to join Field and Stream magazine. **Arthur Kaye** has joined AA as supervisor of industrial deferment.

NEW CAB MEMBER—Ex-Sen. Chan Gurney is sworn in by Harold H. Burton, Associate Justice of the U. S. Supreme Court. Gurney succeeds member Harold Jones, who resigned.

148 out of the 148 Lockheed *Constellations* now in service or on order for U. S. airlines depend on Hamilton Standard *Hydromatic* propellers. In fact, *Hydromatics* now are specified for 98% of all U. S. transports.

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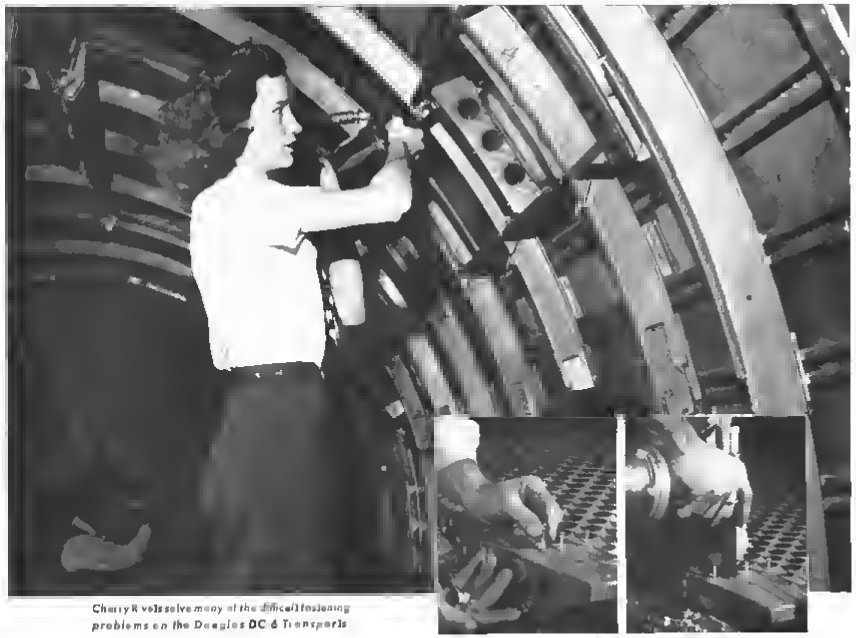

Cherry Rivets solve many of the difficult fastening problems on the Douglas DC-6 Transports

Insert the rivets in the drilled holes. With the gun pull the stem. This expands the rivet into the sheets to be fastened and forms a "tailor head" on the blind side of the work.

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Washington Roundup

End CAB-Airline Fraternizing?

Sen. Paul Douglas, recently busy exposing the use of political influence on Reconstruction Finance Corp. directors, now wants to draw a sharp dividing line at the Civil Aeronautics Board.

Douglas proposes to set down in law a code of ethics for members of CAB—and for all quasi-judicial agencies—patterned on the code the judiciary, with a few exceptions, now adheres to. "And the public protest against the exceptions usually results in ousters from office."

The public reaction to the RFC disclosures has created a favorable climate for enactment of the Douglas code.

To CAB and airline officials, used to chit-chatting about mutual business, it would mean a sharp change in behavior. Douglas' proposed amendments to the Administrative Procedures Act would bar CAB members from:

• Discussing aspects of any case pending before the Board outside the hearing room. CAB members or staff personnel couldn't have private office or telephone conversations with industry representatives. If conferences were necessary, representatives of all sides would be invited. "No judge ever listens to a party in a case before his court in private."

• Accepting any favors from the industry. This would halt free airline junkets by CAB members and staffs, ban them from attending airline-financed social functions. "What judge ever attended a party given by a litigant before his court, or accepted a free joy ride from a litigant?" the Illinois senator queries. "He wouldn't be in office long if he did, and the public knew about it."

• Taking jobs with firms directly or indirectly coming under CAB's jurisdiction, for two years after severance from CAB membership. Two CAB chairmen in the past few years have stepped directly into airline relationships as lawyers.

Douglas would set legal penalties for violations of the code. The general congressional sentiment, however, is that if the code is established, enforcement should be left to the threat of public censure of violations. That's the way it works in the judiciary.

The Douglas proposal would mark an end to the "one happy, squabbling family" atmosphere that has existed between airlines and their government regulatory agency since the latter's inception in 1938.

Congressional Interference in CAB

Sen. Douglas would write out in black and white what's right and wrong in the way of congressional interference in CAB affairs.

• Right: Members of Congress should "refer, explain, and recommend" to the Board. "If congressmen don't keep tabs on the executive branch and prod it, bureaucracy could go wild, corruption, inaction, and laxness flourish. There's nothing most government agencies would like better than to be relieved of congressional watchfulness."

• Wrong: Congressmen should keep "hands off" any case by which they might stand to profit politically, monetarily, or otherwise. In addition, congressmen should not "importunately urge" any decision.

PAA on the Defensive?

PAA officials say they won't wage an offensive for a single carrier over the North Atlantic when the time rolls around next June for reconsideration of PAA and TWA certificates.

"We don't agree with it, but we accept Congress' decision—by its refusal to pass legislation for a single public utility carrier for overseas operations—and we won't fight it," a PAA spokesman said. But TWA representatives already are watching for a move in Congress for single-carrier legislation, although others feel this isn't likely.

Washington observers will be amazed if PAA doesn't plead for a one-carrier North Atlantic operation next June, with the argument that this would be the best way to save the taxpayers' money in mail support.

PAA says it will be on the defensive as much as TWA. "We're faced with a big fight to hold our temporary stops in Paris and Rome. That's what we're going to concentrate our arguments on."

Missing Links

Both USAF's Maj. Gen. Orville Anderson (ret.), and USAF's Maj. Gen. Hugh Knerr (ret.), were set to answer Sen. Kenneth Wherry's call to testify for strategic bombing and against the Administration's plan for a ground forces holding action in Europe. But when the time came for them to appear, they did not. And Wherry was unable to contact them for appearances.

Air Force quieted Anderson several months ago, after he recommended that the U. S. use its one advantage—strategic bombing—in a preventive war with Russia.

Knerr, who recommended abolition of Naval aviation a few years back, is now with an industry dealing with the Navy.

New Investigations

• **House Armed Services Committee**, under Chairman Carl Vinson, is launching an investigation of the defense procurement programs. They've been given $50,000 for the job. The investigation is under the direction of John Courtney, former Justice Department trial attorney and Navy Department investigator. "We're making a general survey now—to find out what ought to be investigated," Courtney commented. "We're interested in the volume, speed, and general performance under the procurement programs."

• **Senate Small Business Committee**, under Chairman John Sparkman, is going to look into the problems of nonskeds. The committee is little business' best friend on Capitol Hill. Senate Interstate and Foreign Commerce, which has regular jurisdiction over airlines, has approved the investigation by the small business committee.

—Katherine Johnsen

AVIATION WEEK VOL. 54, NO 13
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Dispute Over Funds Split Delays Build-Up

$70-billion ceiling set for military funds but no decision on how to divide them.

By Katherine Johnsen

Additional funds needed to continue the vital build-up of U S air power, like the rest of the "emergency" defense program, are being held up by administrative indecision at top levels of the Defense Department

More than three months have gone by since the President declared a nation "emergency" to add urgency to the build-up But it isn't going ahead yet—probably won't be for two or three months, at the earliest

▶ **$30 Billion Squeeze**—Defense Undersecretary Robert Lovett and Assistant Secretary W J McNeil have been patiently but unsuccessfully trying to get the three military services to squeeze under a $70 billion ceiling requirements they've calculated at $100 billion This would include the third supplemental appropriation to the fiscal 1951 budget, and the military position of the fiscal 1952 budget The $70 billion is all the administration wants to spend between now and July 1, 1952

That's the "target date" the Joint Chiefs of Staff have set for readiness to meet all-out war with a substantial nucleus striking force in being for a holding operation, backed by a broad industrial base that could triple arms production virtually at the push of a button by going from one to three shifts of workers

The President, perhaps remembering his cuts of Air Force and Naval aviation strength before the Korean outbreak has not taken a hand in the matter yet But he is expected to set ceilings for the services shortly, on Defense Secretary George Marshall's advice The services hope he will They feel this would be preferable to protraction of hearings, reviews, and revisions that would add up to more delay They would rather see even a cutback program underway, than have no program at all

The Administration has one eye on congressional questioning It doesn't like the prospect of military leaders being "forced" to admit in testimony that their services haven't been allowed adequate funds

▶ **Today's Outlook**—This is the outlook at the present time

■ **The President will set ceilings soon** for each of the services The ceilings will add up to $70 billion He doesn't want to do it, but there seems no other way out of the stalemate.

■ **Army will fare best**—First, there are the needs for the Korean campaign and enlarged forces in Europe then, long time Washington observers are more and more noticing that the Chief Executive, perhaps because of his World War I artillery service, has a sentimental attachment to the Army They detect a manifestation of this in his appointment of Army officers to the three top defense posts Secretary of Defense, Chairman of the Joint Chiefs of Staff, Commander of the North Atlantic Treaty Organization And Secretary of State Dean Acheson, determined to hold Europe with land forces, is for a big Army Army wants $50 billion of the $100 billion It won't get that, but it likely will get close to 50 percent of the $70 billion, under Administration recommendations

● **Air Force will get the big slice of what is left**

● **Navy will get the remainder** And Naval Chief of Operations, Adm Forrest Sherman, probably won't fight for more than his service is handed

■ **Industrial mobilization** plans will suffer seriously Joint Chiefs of Staff are adamant on two points:

They will not change the "target date" of mid 1952 for war readiness And they won't agree to shove it back and cut annual expenditures by spreading the emergency program out over a longer period of time

They will not reduce the striking force that should be in being by that date—a 95 group USAF and a 27-carrier Navy with 8000 first line aircraft They won't cut on weapons procurement or military manpower

Thus leaves as the only alternative a slash in funds allocated for industrial mobilization—reactivations of plants and conversions of civilian plants to military production

● **Defense Mobilizer** Charles E Wilson will fight curtailment of the proposed gigantic military plant expansion He was behind the President's call for capacity for 50,000 planes a year, and later called for capacity for 18,000 jet engines a month But Wilson is likely to be on the losing side. It will be a surprise if he can overcome military reasoning that the 'must" is a striking force in being by mid 1952, if there are to be cuts, they must come out of industrial mobilization Plant capacity won't do much good if there isn't a force in being for a successful holding action when the enemy strikes

▶ **No Early Action**—The Administration probably will finally recommend the $70 billion "emergency" military build up— declared "urgent" last December— to Congress in about six weeks It will probably include somewhere between $15 and $20 billion for Naval and USAF aircraft, engines and related procurement

After the President sets ceilings for each of the services—assuming he does— they will then have to re work their programs, applying cuts, mostly to industrial mobilization Then, the Budget Bureau will have to go over all the details The program could hardly be ready for congress before May It was supposed to go up there early in January

And then the outlook is for more delay in Congress

Sen Kenneth Wherry, Minority Leader and spokesman for the Republican National Committee, wants defense outlays from now until July 1, 1952 held to approximately the $70 billion the Administration is set on But he is against any Administration imposed cutbacks in Naval or air power Wherry wants the cuts to come out of ground forces

"We need invincible Naval and air power—but only a small mobile army to defend the United States," the Nebraskan declares 'But the Secretary of State wants to keep a lot of his foreign diplomatic friends happy by sending American ground troops to their countries all over the world—and break the American taxpayer in the process It's going to cost the U S around $20 billion to build up a 60-division land army in Europe We're going to pay 85 per cent of the cost And it still will not match 250 Russian divisions For a fraction of this, around $7 5 billion, we could buy 3000 B-36 bombers—and if we had that force, I think Russia would think more than twice before ever attacking

"We only have a few dozen B-36 bombers today—yet the Administration is ready to drain the treasury equipping Army divisions, Each division costs $400 million. Last December the Army strength was to be 20 divisions, now, I understand the Administration has upped this to 27 divisions—but Naval and air force strength haven't been correspondingly upped."

If admirals and Air Force generals don't admit their services are being held down by the Administration ceiling of $70 billion, it won't be because Sen Wherry doesn't grill them

▶ **Loaded Questions**—A member of the Senate Appropriations Committee, Wherry says "I intend to ask every one of those Air Force generals and admirals, 'Sir, is this the program you advocate, or is this something you are swallowing because it was pushed down your throat by the land-bound Administration?'"

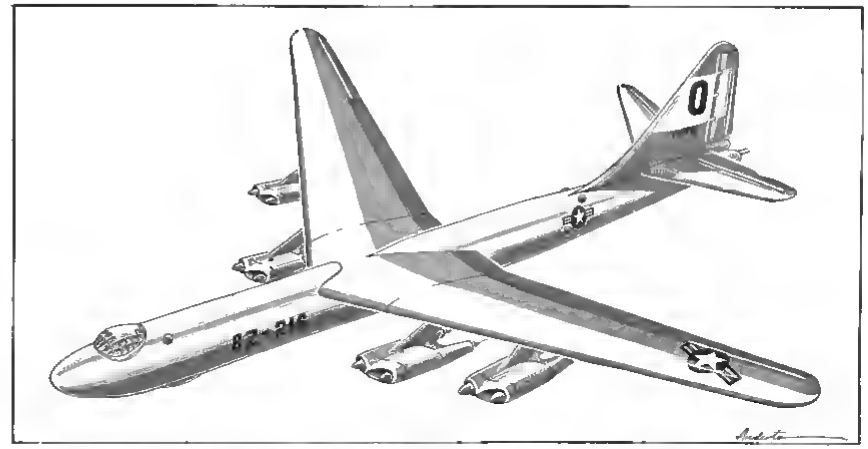
Wherry has won the first round in his fight for more emphasis on air and Naval power, less on land forces The Senate Foreign Relations and Armed Services Committees have approved his plan requiring the President to get a congressional okay before sending any more Army divisions to Europe

Between now and the time Congress approves "emergency' program funds, USAF and Navy will be without money for more aircraft procurement and new research and development projects Virtually all of the pre "emergency" funds granted last December have been committed

Armed services strength in manpower, materiel and industrial base for weapon production have been steadily increasing since last June's Korean outbreak jolted the Administration from its severe defense economizing But these increases have been under pre-"emergency" programs. The military refer to them as "bolstering the defense posture"—plus taking care of Korean attrition They are modest build-ups They weren't conceived to put the U S in readiness for all-out war by mid-1952 And the Joint Chiefs of Staff now say we must be ready by then

These increases have stirred up activity in inductions, contract letting, and plant and installation reactivation They have given a false impression that the country's defense mobilization is moving full-steam forward The activity, actually, reflects little more than the depleted takeoff base of last June, after a year's slashing of defense strength

There remain, however, numerous problems to be solved in the higher echelons of our government before the U S can be considered ready for an all out war



CONSOLIDATED VULTEE'S BIG EIGHT-JET VERSION OF THE B-36 INTERCONTINENTAL BOMBER

This is a staff impression of Consolidated Vultee's sweptwing all-jet-engined version of the B-36. Under development contract, two are to be built at Convair-Fort Worth One of the huge planes now under construction will probably fly late this year. Current production B-36E bombers have a wing span of 230 ft. Overall dimensions of the sweptwing version remain essentially the same, but wing panels on either side of the main landing gear and lateral tail surfaces will be swept back at 35 degrees. Eight jet engines are to be slung two in a pod in two pods beneath each wing. Current plans are that General Electric J-47 turbojet engines will be installed initially to permit immediate flight testing of the plane until the more powerful Pratt & Whitney J 57s are available Design performance calls for a top speed of 550 mph at 55,000 ft Strategic requirement for carrying 10,000 lb. 10,000 mi. remains the same Crew complement is 11 plus relief crew of four. Sketch of sweptwing turboprop-engined B-36 which will be final configuration of the B-36 before scheduled phase-out, was in Aviation Week, Nov. 20

CAB Drops Its Case Begun in '48 on NAL

Last week the CAB lifted the thundercloud that has shrouded National Airlines' prospects for 2½ years.

The Board announced it has dismissed the so-called National dismemberment case—the National route investigation case started September, 1948

At the same time, the Board says it will expedite the National-Panagra interchange proceeding This would enable National and Panagra to offer one-plane service Buenos Aires-New York, perhaps this summer (Aviation Week Mar 19)

The Board also issued a show-cause order promoting Balboa New York interchange service by either another Panagra National interchange or a Braniff-Eastern interchange. This proceeding will, of course, take some time, starting from scratch last week

Among the CAB's compliments to National Airlines were the following statements "National is a low cost operator" and "Most recent figures tend to show that continued performance for future periods may well result in its becoming self sufficient"

Fairey's Delta Research F.D.1 Makes First Flight

The Fairey Delta One, third member of Britain's triangular aircraft research trinity, made its first flight March 12 at Boscombe Down with Group Capt R C Slade as pilot

F D 1 is an airplane of tiny proportions its wingspan is a diminutive 19 ft 6½ in., and overall length is only 26 ft 3 in Power comes from a single Rolls-Royce Derwent turbojet and tricycle landing gear is fitted

▶ **Research Plane**—Aerodynamically, the F.D 1 is similar to the earlier British delta winged craft, the Avro 707B and the Boulton Paul P 111. There is one notable difference, though, a small horizontal tail has been mounted on the F D 1 for early flight testing In addition, fixed tip slots have been added for the preliminary flights

Air brakes and wingtip parachutes can be used to deal with flight emergencies, and a single drogue parachute is installed for braking and during the landing run or in emergencies

Flight controls take the form of elevons and rudder, presumably the horizontal tail is only for stability and not control

The development of the F D 1 is an outgrowth of an extensive program conducted by the Fairey Aviation Co. Ltd. Basic aerodynamic research with wind tunnel and radio-controlled scale models preceded the first flight of Fairey's Delta

CAB Powers

Rentzel asks Senate unit for more authority over the airline industry.

The Civil Aeronautics Board is pushing for a much tighter grip over the airline industry

CAB's Chairman Delos Rentzel told the Senate Interstate and Foreign Commerce Committee what new authority the Board wants, and why He wants power to

• **Compel carriers to initiate** new services. The power is needed for the establishment of a sound route structure, and particularly desirable during the emergency to meet defense requirements, he said Now the Board only compels service to new points modifying a carrier's existing route

• **Tell carriers what type of equipment** to use "Large losses" have followed use of unsuitable equipment CAB can now indirectly influence equipment purchases by carriers by cutting down mail support for uneconomical operations, later "But this is locking the hangar door after the airplane has been purchased," he commented "We need power to deal with this problem before commitments are made."

• **Limit frequency of service** This is needed primarily for the international field Some foreign governments are willing to agree to allow American carriers only a limited ent of their traffic When CAB can't assure limited service, there's difficulty in reaching agreement

• **Control rates of U S international carriers** When CAB can't assure foreign governments U S airlines won't go in for cut throat competition it handicaps the reaching of agreements Congress has turned CAB down on this since the end of the war

• **Compel equipment interchanges** by U S international carriers Board now has this authority for the domestic field

• **Control security issues.** CAB has been asking for this authority for years It's doubtful Congress will grant it this year

• **Order ticket agencies** to cease and desist from unfair or deceptive practices Board's jurisdiction now extends only to carriers Agents for irregular carriers in particular, have gone too far in CAB's opinion trying to whip up business

• **Limit subsidy** to carriers in route certificates Service mail pay will have to be separated from subsidy before this authority can be applied CAB is now making a study on that. Congress will probably put through legislation this year directing the separation, and earmarking a portion of the subsidy as subsidy to communities for uneconomical service

• **Regulate contract carriers**

▶ **Streamlining Program**—CAB's streamlining program to "confine activities to essential matters, eliminate frills, and produce a workmanlike product as expeditiously as possible," Rentzel reported, is going well

The Board's basic objective now is to stabilize the air transport industry by setting permanent mail rates and lowering the subsidy requirement through mergers, elimination of uneconomic service In general, he said, the Board will shy from awarding new competitive routes

Both irregular carriers and feeders have important roles in a satisfactory air transport system, he said

• **Irregulars.** "They fill in the gaps in the system, provide a leavening of fresh thought and innovation and are always available for emergency needs Their role is an important and responsible one"

• **Feeders** The results of the feeder experiment are encouraging and indicate the need for continued development of this segment of air transportation system of the U S It is doubtless true that some carriers may have to be discontinued as not being economically required . . . On the whole, however the Board feels gratified at the results achieved in its local service program"

CAB is interested in the possibilities of transferring marginal trunkline points to local carriers, he pointed out.

▶ **Additional Legislation**—CAB is asking for additional legislation on

• **Temporary foreign service certificates** National defense may require prompt service by foreign carriers which would be stalled by the requirement for a full-dress hearing

• **Red-tape cutting authority** Power to relieve carriers of the necessity of filing routine contracts

• **Civil penalties** Make minor violations of economic provisions subject to civil instead of criminal sanctions "Criminal sanctions are difficult to enforce, are cumbersome, and leave a stigma on the violator that is not always necessary or desirable"

• **Repair work.** Relieve agencies and carriers doing aircraft repair work from the necessity of employing only certificated personnel "In a period of expanding emergency activity where new mechanical personnel are being employed every day, it is not believed desirable to hamper the efforts of both industry and the Administrator by requiring that these airmen be certificated"

• **Foreign irregular operations** Transfer jurisdiction over these operations in the U S from Civil Aeronautics Administration to the Board CAA agrees that it should be transferred

Delta Places Order For 10 Convair-340's

Delta Air Lines has joined the Convair-Liner 340 bandwagon with an order for ten 44-seat versions to cost approximately $6 million—plus an option for five more Deliveries are scheduled for next year This Delta order brings Convair's 340 backlog to 76 plus ten which are considered as fairly firm on option

The Atlanta-based carrier plans to use its new planes on medium-length and short flights to supplement its present all-Douglas fleet of 7 DC-6s, 6 DC-4s, and 17 DC-3s Convair-Liner 240s are in service with Northeast Airlines, with whom Delta has a merger pending, subject to CAB approval

The Delta 340s will have a built-in hydraulic front passenger ramp on the left side, with a carry-on baggage rack just inside the entrance The rear door will be used exclusively for ground serving to eliminate interference with passengers

The airline's operations department tested a Convair Liner over its Dallas-Atlanta DC-3 run and noted a flight time savings of 56 min The new model, which cruises eight miles per hour faster than present 240s, could cut this even more

UAC Aims High

Huge backlog and bright prospects spark United expansion program.

United Aircraft Corp., already by several standards the nation's largest aircraft firm, is planning an expansion that will make it even bigger

With a backlog of nearly three-quarters of a billion dollars and 1950 sales of more than one-quarter billion dollars, the company disclosed last week in its annual report that it will spend $30 million on plant expansion for which the government will furnish $95 million worth of machinery and equipment

New construction, spread over the next 15 months, will add 1.5 million sq ft of floor space to UAC's Pratt & Whitney Aircraft, Hamilton Standard and Sikorsky Aircraft divisions

The report indicates why the expansion is needed

• **Backlog** of $715 million on Dec 31 1950, more than double what it was at the beginning of the year

• **J-57 production order** is being negotiated with the Air Force for a "substantial number" of the axial-flow jet engines for use in undisclosed aircraft

• **Canadian Pratt & Whitney Aircraft** Co will go into production on R 1340 piston engines in a new plant the first time that company has been called upon to manufacture complete engines

• **Increased demand** for Hamilton Standard propellers requires more plant capacity at that division, as well as the licensing of Nash-Kelvinator Corp to produce four H5 propeller models

• **Air conditioning equipment** made by Hamilton Standard has been ordered for the North American F-86 Sabre, Lockheed F-94C and Chance Vought F7U Cutlass.

Sikorsky division already has embarked on plant expansion (AVIATION WEEK Mar 12, p 15) to handle its added helicopter orders, and Chance Vought has new orders for its piston-engine F4U-5 Corsair and F7U Cutlass

Vought also is in limited production on guided missiles for experimental use by the Navy

United's 1950 sales of $269 255,388 resulted in a net profit after taxes of $13,204,128—higher even than the last war year, 1945, when profit was $12,855,280 In 1949, UAC showed a net after taxes of $10,093,182 on sales of $227-055,032

Because of the $30 million UAC plans to spend on the new construction the corporation is arranging for new financing to build up its cash

Sikorsky, McDonnell Copters for Marines

Two new experimental Marine assault transport helicopters, ordered from Sikorsky and McDonnell, are expected to be bigger single-rotor craft and better suited for combat work than anything produced up to this time

The McDonnell craft will have a three-bladed jet-propelled rotor following in the line of development which the St Louis manufacturer helped pioneer with its Little Henry ram-jet copter (Air Force XH-20) Informed sources indicate that the McDonnell development will be a "Buck Rogers" craft of radical design

Sikorsky's new machine will be more conventional in design, it is indicated, and will be essentially a larger development of the ten place S 55 which has already been ordered by the Navy as an off-the-shelf Marine transport with an HR1S designation

A well known ideal requirement for an assault transport helicopter is for one which would carry, besides its crew a complete unit of fighting men with their equipment, such as a 12-man or 16-man platoon, capable of fighting as a unit Such a requirement, if met in the new machines, would provide a distinct advantage for assault troops using the craft

▶ **Five-Blade Main Rotor**—That the Sikorsky machine will carry a considerably bigger load than the S 55 is indicated by the fact that it will have a five-blade main rotor The additional rotor blade area is a means of putting a greater load on the rotor without increasing the rotor disc diameter beyond the dimensions which can be accommodated for a shipboard operation Since the three blade rotor of the S 55 is powered by a 600 hp Pratt & Whitney Wasp engine, the power-plant of the new machine will obviously be considerably more powerful in order to accommodate the additional load, probably in the 1000 hp class or beyond

Presumably the new Sikorsky will be designated HR2S as distinguished from the H1S (S 55) and the McDonnell jet copter will be designated HR1H since it is the first McDonnell Marine assault craft

Temco Gets USAF Order for TF-51s

A USAF production order for a "substantial quantity" of two-place tandem TF-51 Mustang trainers calls for a fully engineered conversion of the single seat F-51 fighter of World War II, unlike earlier "piggy back" two-place Mustangs, Texas Engineering & Manufacturing Co., Dallas, has announced.

The Temco conversion requires major structural changes to adapt F 51s, taken from mothballs, to their new trainer mission. A new full-sized rear cockpit with full dual controls and instrumentation has been installed, front instrument panel has been rearranged and a new radio installation has been made. A redesigned canopy to provide full visibility for student pilot and instructor, has been incorporated with a power mechanism for opening and closing.

Powerplant, a 1665-hp Packard-Rolls Merlin engine, and top speed of well over 400 mph are comparable to those of the World War II F-51.

As a trainer, the TF-51 is described as the fastest and most powerful single-engine propeller driven plane in production for the Air Force.

Originally a North American Aviation product, the F-51 in its new trainer version rounds out a remarkably complete trainer grand slam for one manufacturer. USAF is using as trainers also, the T-6, the T-28 and a trainer version of the twin engine B-25, all North American products.

Award of a production contract for TF-51s to Temco returns to the big Grand Prairie, Tex., plant operated by Temco, a plane which was produced there in large quantities during World War II. At that time North American Aviation operated the Texas facility to build Mustangs, under direction of the present Temco president Robert McCulloch.

McCulloch MC-4 Makes First Flight

A surprise entrant in the helicopter field was disclosed last week with the first flight of McCulloch Motors Corp.'s two-place, tandem rotor MC-4. The Navy has placed an order with McCulloch for an MC-4 for evaluation.

The new rotorcraft is a product of two years of development by McCulloch, which previously has been a manufacturer of low horsepower engines used in target aircraft and industrial applications.

McCulloch says the MC-4 features control stability, absence of vibration resulting in simplified piloting, and low production cost. To cut the cost, the company says it uses standard components for engine and drive, and a new rotor blade fabrication method.

In its civilian version, the MC-4 is designed for crop dusting, pipeline patrol, forestry patrol and other industrial usage.

The MC-4 uses a 165-hp six-cylinder Aircooled engine driving two intermeshing three-bladed rotors arranged in tandem. Rotor diameter is 22 ft. Copter is 32 ft., 5 in. long, and overall height is 9 ft., 1 in. Gross weight is 1800 lb., empty weight, 1200 lb. Cockpit seats two side by side, with dual controls.

The company estimates performance as top speed at sea level, 100 mph., operating speed at sea level, 75 percent power, 85 mph., service ceiling, 16,000 ft., hovering ceiling, 6000 ft., vertical rate of climb, sea level, 675 fpm.; maximum climb, sea level, 1520 fpm; range at operating speed, 260 mi.; maximum endurance, 4 hr., 15 min.

Our Expanding Industry . . .

Willys-Overland Motors, Inc. has received an order for components of the General Electric J 47 engine and will go into production at the 226,000 sq. ft. plant at Anderson, Ind., operated during the war by Chevrolet. Company said it is starting immediately on a $7-million tooling program, but did not divulge the dollar value of its contract other than to say it exceeds a recent $63-million order for military jeeps.

William S. Jack, one-half of World War II's famous Jack & Heintz combination, is going back into aviation production at a 60-acre, $1.2 million plant near Riverside, Calif. (He retired from the Cleveland firm after the war.) Jack says that within a year the new plant will employ 4000 on the manufacture of instruments for the Air Force and Navy, with a monthly output worth $5 million.

A. O. Smith Corp., Milwaukee, is leasing a 300,000-sq. ft. plant for production of B-47 landing gear under subcontract from Boeing.

AiResearch Mfg. Co., Los Angeles, has new orders totaling more than $5 million for small gas turbine engines used as auxiliary power sources and jet engine starters.

Westinghouse Electric Appliance Division, Mansfield, Ohio, has received a multi-million dollar contract for fuel tank and armament pylons for Republic F-84 Thunderjet fighters.

Texas Engrg. & Mfg. Co., Dallas, has received a facilities contract from the Navy to purchase and install in the Dallas Plant machinery and equipment for the manufacture of a modern military aircraft."

Ask Prototype Aid For Helicopters

Clarence Belmn, president of Los Angeles Airways, pioneer helicopter mail carrier, thinks the enormous strides the helicopter industry has made through its own efforts in the past three years have earned it a helping hand from the government.

Last week he asked the Western region meeting of the American Helicopter Society at Los Angeles to support his proposal that the prototype testing act (Public Law 8(7) be amended to make its primary objective the development and testing of large commercial helicopters. The copters would be adaptable for military use, but built around commercial requirements.

Belmn wants a copter of approximately 12,000-lb. gross weight, carrying ten passengers, using engines in the R-1340 (550 hp.) class and convertible to turboprop engines. Capital investment should not exceed $20,000 a seat, and power loading should be about 9 lb./hp.

The ideal helicopter for the U. S. Marines, described by Lt. Col. George Herring, commander of Marine Transport Helicopter Squadron 161, would be somewhat different. It would carry 20 fully equipped troops or 5000 lb. of cargo a distance of 400 nautical miles and would have two features heretofore not generally considered: rotor arranged so no folding would be necessary, and a device for taxiing independent of the rotor system (an essential for carrier operation).

National Science Unit Names Dr. Waterman

Chief scientist of the Office of Naval Research, Dr. Alan T. Waterman has been nominated to the $15,000 a-year post of director of the new National Science Foundation.

He was recommended by the foundation's 25-member policy board, headed by Harvard President James B. Conant.

The foundation was appropriated $225,000 last December for organization. The President is expected to request a $10,000,000 appropriation for it to launch its program of promotion of basic research in the near future.

Negotiated Contracts

Negotiated awards totaling over $66 million are listed by the Air Force for the week ended Mar. 9.

Bendix Aviation Corp., which is said to have more individual defense contracts than any other American producer, divided more than one-quarter of this total among several of its divisions, for radar sets, autopilot components, boost controls, generators and carburetors and carburetor parts.

Other large awards went to Gilfillan Brothers, Inc., Los Angeles, for radar sets ($9.5 million); Federal Telephone & Radio Corp., Clifton, N. J., for ground radio transmitter (over $6 million); Allison division of General Motors Corp., Indianapolis, for engine spare parts (over $5.5 million), Connecticut Telephone & Elec. Corp., Meriden, Conn., for telephone equipment (over $4.6 million), B. G. Corp., New York, for spark plugs (over $2.6 million).

Aeroquip Corp., Jackson, Mich., aircraft hose, Cl. 04B, $52,330.

Anthem Mfg. Co., St. Louis, brake, sheet metal, Cl. 17A, $59,151.

Allison division, Indianapolis, engine spare parts, Cl. 02Q, $5,549,663.

Ampco Metal, Inc., Milwaukee, propeller cans, Cl. 03A, $41,415.

Ansurd Machine Works, Inc., Chicago, milling machines, $128,000.

Archie Fur Co., Seattle, wolf fur, Cl. 13, $131,175.

Avco Mfg. Corp., Cincinnati, motor assemblies, $49,548.

Aviation Engrg. Corp., Woodside, N. Y., amplifier, Cl. 05D, $84,411.

Bendix Aviation Corp., Baltimore, radar sets, Cl. 16C, $10,000,000.

Bendix Aviation Corp., Teterboro, N. J., automatic pilot components, Cl. 05F, $3,600,000, boost controls, Cl. 03D, $97,527; generators, 03C, $62,890.

Bendix Aviation Corp., Towson, Md., radar sets, Cl. 16C, $3,000,000.

Bendix Products div., Bendix Aviation, South Bend, Ind., carburetors & spare parts, Cl. 03D, $572,885; carburetor assy., Cl. 03B, $968,991.

B. G. Corp., New York, aircraft spark plugs, Cl. 03H, $2,659,985.

Bliss & Laughlin, Inc., Harvey, Ill., rod & bar, Cl. 23A, $316,629.

Bradford Machine Tool Co., Cincinnati, engine geared head lathe, Cl. 17A, $345,717.

Lees Bradner Co., Cleveland, thread mill, $28,185.

Carlton Machine Tool Co., Cincinnati, radial drills, $64,000.

Cincinnati Lathe & Tool Co., Cincinnati, engine geared head lathe, Cl. 17A, $62,572.

Cincinnati Milling & Grinding Machine, Cincinnati, milling & grinding machines, $930,874.

Cleereman Machine Tool Co., Green Bay, Wis., drilling machine, $26,526.

Connecticut Telephone & Elec. Corp., Meriden, Conn., telephone central groups, Cl. 16C, $4,606,976.

Cosa Corp., New York, gear grinding machines, $1,879,600.

Dayton Aircraft Products Co., Dayton, hydraulic jacks, Cl. 19A, $45,039.

Dayton Blue Print Co., Dayton, pens, lettering guides, Cl. 25B, $48,712.

Douglas Aircraft Co., Inc., Santa Monica, Calif., aircraft spare parts, Cl. 01D, $120,000,000; aircraft spare parts, Cl. 01D, $200,000.

E. I. du Pont de Nemours & Co., Wilmington, Del., trichlorethylene, Cl. 24, $77,000.

Durham Mfg. Co., Covington, Ky., vertebrae & tip Assy., tow target release, Cl. 28B, $53,523.

Edo Corp., College Point, N. Y., float and strut assy., Cl. 03G, $66,220.

Electronic Brazing Co., Montclair, N. J., indicator assembly, Cl. 17C, $29,490.

Electric Storage Battery Co., Cleveland, batteries, Cl. 03C, $515,836.

Elvair Corp., Jackson, Miss., target, tow, Cl. 28B, $199,572.

Fairchild Engine & Airplane Co., Hagerstown, Md., aircraft spare parts, Cl. 01R, $197,000, aircraft spare parts, Cl. 01R, $850,915.

Federal Telephone & Radio Corp., Clifton, N. J., ground radio transmitter, Cl. 16B, $6,373,475.

Franklin Machine Products Co., Inc., New York, lead assy.; tow target, Cl. 28B, $39,600.

Garland Construction Co., Rapid City, S. D., maintenance docks, Cl. 19A, $119,038.

General Electric Co., Schenectady, N. Y., tachometer indicator, Cl. 05D, $63,525.

G & M Equipment Co., N. Hollywood, Calif., oscillator, Cl. 16A, $194,647.

Gibbs Mfg. & Research Corp., Janesville, Wis., switch boxes, Cl. 16A, $208,864.

Gilfillan Brothers, Inc., Los Angeles, radar sets, Cl. 16C, $9,500,000.

B. F. Goodrich Co., Akron, sponge rubber, Cl. 04B, $45,000.

Guardian Electric Mfg. Co., Chicago, control switches, Cl. 11B, $150,080; control, projector release, Cl. 11B, $46,096.

Hammond Mfg. Co., Pasadena, Calif., B-Z maintenance stands, Cl. 19A, $147,467.

Heald Machine Co., Worcester, Mass., double end boremaster, $85,600.

Jack & Heintz Precision Industries, Cleveland, inverters, Cl. 03C, $1,395,909; generators, Cl. 03C, $847,585.

Jones & Lawson Machine Co., Springfield, Utah, grinders, $96,630.

Keystone Watch Case div., Riverside Metal Co., Riverside, N. J., indicator, position, Cl. 05 G, $115,853.

Kollsman Instrument div., Elmhurst, N. Y., pilot's standby compass, Cl. 05A, $45,910.

Lake Erie Engineering Corp., Buffalo, hydraulic presses, $258,900.

Landis Tool Co., Waynesboro, Pa., machinery and equipment, $147,930.

La Pointe Machine Tool Co., Hudson, Mass., broaching machines, $170,672.

Lewis Engrg. Co., Naugatuck, Conn., temperature indicator, Cl. 05D, $59,004; indicator, temperature, Cl. 05D, $67,035.

Liquidometer Corp., Long Island City, N. Y., fuel indicators, Cl. 05G, $202,950.

Lockheed Aircraft Corp., Burbank, Calif., aircraft spare parts, Cl. 01L, $823,448; aircraft spare parts, Cl. 01L, $350,000; aircraft spare parts, Cl. 01L, $500,000.

Metal Industries, Inc., Indianapolis, metal shipping containers, Cl. 43, $191,613.

SIDELIGHTS

(Continued from page 8)

automatic radar gunsight which the AF unveiled last year at the Las Vegas aerial gunnery meeting.

Civil Aviation

Piper Aircraft Corp. will demonstrate two new versions of the 125 hp. Super Cub, designed for spraying & dusting, seeding fertilizing, on Mar. 28 at Washington-Virginia Airport, near Washington. . . . Trans Texas Airways Sales & Service div., Houston, Tex., Municipal Airport, is named the first distributor for the new Aero Commander twin-engine executive transport that goes on sale in September. R. E. McKaughn, Trans Texas president, will have the franchise for Texas & Louisiana. . . . Beverly Howard's Hawthorne Flying Service, Charleston, S. C., started a basic pilot training school for USAF at Spence Field, Moultrie, Ga., on Mar. 17, with 134 students. . . . Briefing for members of the Conference of National Aviation Organizations at the Pentagon last week covered latest developments in air defense personnel, training, airports, CAP activities, and other civil air matters.

CAA

The agency gave special training programs to 74 foreigners in the last half of 1950. Of these, 36 are Latin Americans and three are Far Easterners sponsored by the State Dept. 28 are Europeans sponsored by ECA, 4 are Icelanders and 3 are Japanese, approved by the Defense Dept. Remainder came on their own initiative.

Industry

Wage Stabilization Board has affirmed a 6 percent hourly pay increase for more than 18,000 Convair employes represented by IAM at Fort Worth, effective Mar. 12. Employes not represented by IAM received similar increases Oct. 16, 1950. All of the more than 27,000 Convair employees of Fort Worth division are now covered by the 6 percent increase. . . . Kaiser Frazer has joined Aircraft Industries Assn. . . . Hughes Aircraft is surveying sites for further expansion in Los Angeles County. . . . Royal Australian Air Force will buy Lockheed P2V-5 patrol bombers under the U. S.-Australia Mutual Defense Assistance Program. . . . North American's Los Angeles plant has set a new all-time high record for plant safety in the aircraft industry, with a total of 5,932,234 man hours without a disabling injury, making NAA eligible for the National Safety Council award of distinguished service to safety. . . . Kaiser Frazer Corp. has received more than 20 carloads of machine tools and equipment from USAF machine tool stock piles for installation at its Willow Run plant for the Fairchild C-119 program, which will occupy about a million square feet, or about a third of the total plant space. . . . Lockheed says cost of electronics for an F-94 is about the same as the price of a complete Lockheed Electra twin-engine transport in the early '30s, or about $60,000.

Aircooled Motors, Inc., Syracuse, N. Y., has engaged Richards & Webb, Inc., Syracuse, as its ad agency.

FINANCIAL

Douglas, UAC Declare Stock Splits

In period of rising earnings, dividend shares help broaden ownership base and investment interest.

With earnings rising, more aircraft companies are declaring stock dividends as part of their financial policies. Douglas Aircraft Corp. and United Aircraft Corp. are the latest to take this action, and others are likely to follow.

Douglas recently declared a two-for-one stock split subject to stockholder approval on Apr. 18. United Aircraft declared a 20-percent stock disbursement, also subject to stockholder sanction on Apr. 24.

The Douglas action, anticipated here Oct. 23, 1950, will serve to double the company's capital stock from 600,000 to 1,200,000 shares. In place of the present stock selling around $102 per share, the new shares will have an equivalent two-for-one quotation of about $51.

This action, in itself, will tend to create a broader investment interest in the company.

The United Aircraft 20-percent stock dividend will serve to increase the company's common stock by 318,804 to a total of 3,188,041 shares. The management has already indicated that the existing $2.00 per share dividend rate will be maintained on the enlarged capitalization. This merely reveals still another purpose of stock dividends as a convenient avenue to increased cash disbursements.

▶ **Reflect Earnings**—Stock dividends, in themselves, do not create any additional value.

The basic equity remains the same. For example, as in the Douglas action, two new shares of the company will have the same value as possessed by one existing share. Most stock dividends reflect conditions of rising earnings with the expectation that a higher plateau of cash distributions will soon follow.

Further, with more shares at a lower market price available in contrast to a limited supply of stock at higher quotations, the security is made more attractive for broader public participation.

Stock dividends have become more pronounced in recent years for the aircraft industry.

▪ **McDonnell Aircraft Corp.** last October declared a two-for-one split increasing its outstanding shares from 360,000 to 720,000.

▪ **Grumman Aircraft's** first 100-percent stock dividend in June, 1948, resulted in increasing its shares from 500,000 to 1,000,000. Late last year another two-for-one split was declared, increasing the company's capitalization to 2,000,000 shares. As noted here on Dec. 18, 1950, this action, supported by a strong uptrend in earnings, helped enhance market values for the company's equity.

▪ **Beech Aircraft Corp.** declared a stock dividend of 50 percent, increasing its outstanding shares from 400,000 to around 600,000 as of Dec. 31, 1948. Constructive results followed this action as well.

▪ **Cessna Aircraft Co.** in 1944 declared a two-for-one split increasing its outstanding shares to 700,000.

▶ **More Splits?**—Currently, reports persist that Boeing Airplane Co. may declare a stock dividend. Its present capitalization consists of 1,082,454 shares. It is known that the company has the largest backlog of business in the industry.

This may serve as a convenient back drop for the stock split.

In the same connection, Lockheed Aircraft Corp. is mentioned in financial circles as another likely prospect for a stock dividend. The company now has about 1,100,000 shares of common stock outstanding. Its backlog of orders together with the trend of earnings encourages the company's supporters in anticipating a stock split of some sort.

▶ **UAC to Call Preferred?**—The United Aircraft stock dividend has also given rise to conjecture as to the possibility of the company calling its preferred shares for retirement within the next twelve months. At the present time there are a total of 258,865 shares of $100 par value 5 percent convertible preferred shares outstanding. This $25,886,500 issue is convertible into common stock at the rate of 2½ shares of common for each share of preferred, prior to Jan. 1, 1952. (This will be adjusted to give effect to the stock dividend.) The redemption price for the preferred is $105 per share up to the Jan. 1 date and is given as $102.50 thereafter.

If conversion of the preferred is desired by the company, it will have to be accomplished prior to this year-end. Moreover, with present high taxation rates, it may be more advantageous to United Aircraft to remove the dividend drain, which is non-deductible for tax purposes. If new funds are required for replacement, a short-term debt issue on which interest will be tax deductible, can prove far more advantageous to the company and available at a lower capital cost.

United Aircraft is known to be in excellent financial condition. As of June 30, 1950, its net working capital exceeded $83 million. While its current backlog of business, last reported at more than $700 million, may increase demands on working capital, the company can readily effect the retirement of its preferred shares without any undue strain on its financial structure.

For the nine months ended Sept. 30, 1950, United Aircraft reported net income of $9,341,533 or $3.15 per common share. For the full year 1950, net earnings have been estimated at $4 per common share. In recent years, United has paid an annual dividend of $2 per common share. The stock dividend and the maintenance of the same rate on the enlarged number of shares has the effect of increasing cash dividends by 20 percent.

The Douglas stock-split came after long resistance by the management to this course. With a relatively small number of shares outstanding along with a high unit market price, there was limited investment interest in the company, according to informed observers.

It is thought probable that the outstanding success achieved by Grumman in its enlightened financial relations policy by well timed stock splits stimulated by a rising earnings trend, may have pointed the way for Douglas and others to come.

General Motors has demonstrated the financial sagacity and astuteness of well-conceived stock dividends. This was accomplished in the face of an already very large outstanding common stock issue created by past stock-splits. Yet, in October, 1950, GM declared a two-for-one stock dividend creating a total common stock issue of 88,208,680 shares.

The company's productive base and earning power readily supported this action which was of substantial value to stockholders and hence to the enhanced investment standing of the corporation.

As long as basic earning power is present, aircraft companies have nothing to fear from a rational stock dividend policy where circumstances warrant. Such a course can build improved credit standing among investors with a minimum of cost.

—Selig Altschul

TEMCO's Five-Year Growth Outstanding in Aircraft Industry

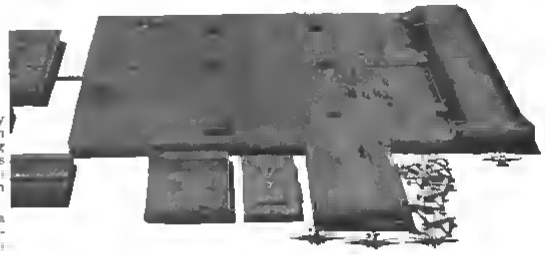
Founded in Dallas six years ago by executives of the Texas Division of North American Aviation, Texas Engineering and Manufacturing Company's growth is the direct result of the ability and experience of its founders and the organization they have built around them.

Starting at the end of the war with a nucleous of highly skilled aircraft technicians and one of the most modern facilities in the aircraft industry including a 3,000-ton hydro press—one of the largest in the Southwest—and three different types of stretch-forming presses, TEMCO has constantly expanded its organization and equipment to meet growing demands for its services. Recently, it entered into a facilities contract with the Navy Department for the supply of a full complement of equipment adequate for the manufacture of military aircraft which will make it possible to increase production to the full capacity of the building area, and which within the next few months, will make TEMCO one of the top aircraft manufacturing plants in the country.

TEMCO's early projects included the manufacture of the Fairchild F-24, the Swift personal plane, and more recently, a trainer of its own design and manufacture, the TEMCO T-35 Buckaroo, Y-models of which were delivered to the U S A F in 1950.

One of TEMCO's first major jobs was the manufactura of large sub-assemblies for the Fairchild C-82 Packet. Currently TEMCO is working on major assemblies for Lockheed and Boeing plus the modification of an undisclosed number of F-51 Mustang Fighters and C-54 Flying Hospitals.

Now employing upwards of 4,000 people and constantly increasing, TEMCO has one of the highest payrolls in the Dallas area.



Aerial view of TEMCO's outstanding facilities —a million and a quarter square feet completely air conditioned. The outdoor ramp is adjacent to Hensley Field, Dallas, Texas.

TEMCO

ENGINEERS AND MANUFACTURERS FOR THE AIRCRAFT INDUSTRY

Production Ingenuity Highlights TEMCO's Manufacturing Methods

Selected by U.S.A.F. as one of the major overhaul facilities for planes on the Berlin Air Lift, TEMCO for the first time in the history of the aircraft industry set up overhaul work on a production line basis. The ability to design tools and manufactura thousands of scarce spare parts plus a production line ingenuity for developing new techniques and methods contributed to TEMCO's reducing the overhaul time on a C-54 by 42 per cent. This resulted in the saving of thousands of hours of time and hundreds of thousands of dollars.

Complete Accessory Shops a TEMCO Feature

TEMCO's accessory shops are specially equipped and designed for testing and overhaul of propellers, radio and radar equipment, instruments and hydraulic assemblies for military and transport aircraft. These shops are completely air-conditioned, with the radio and radar shop shielded and dust-free.

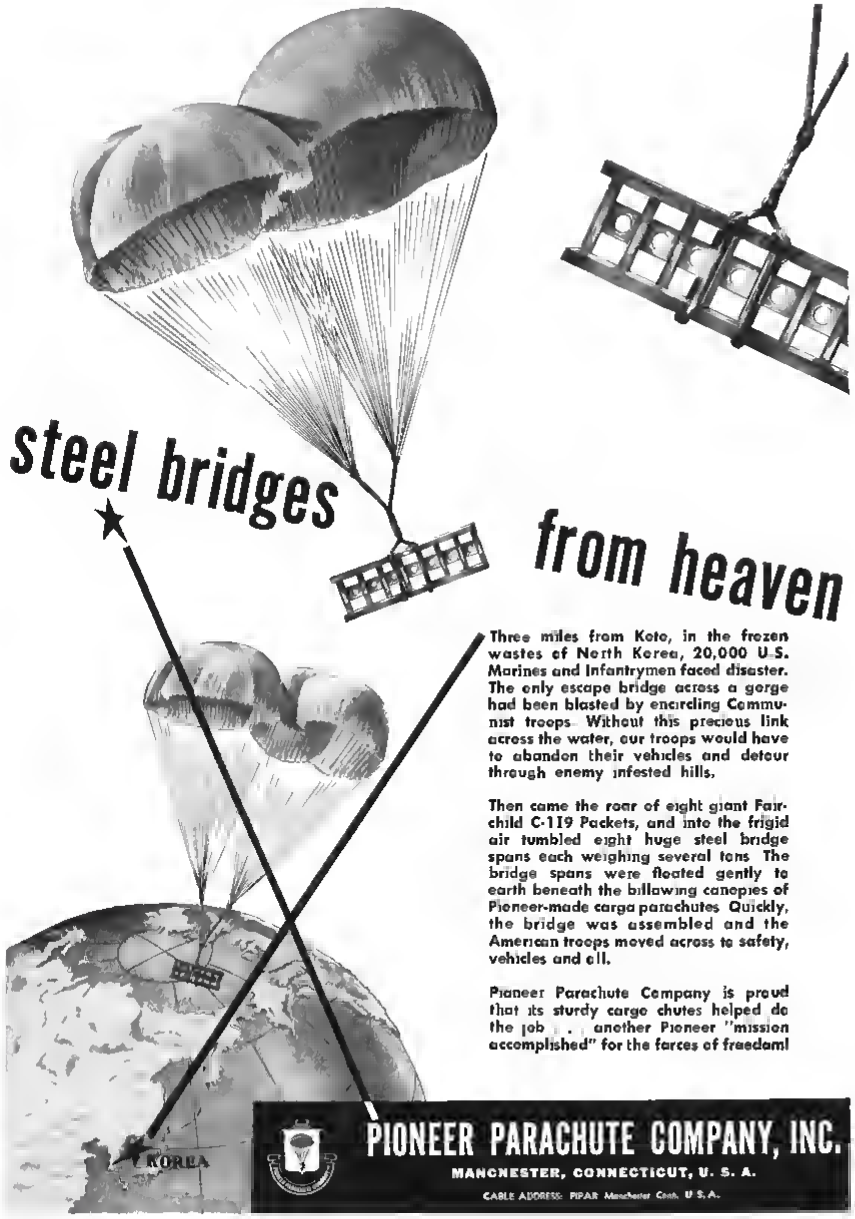
Starting in 1945 with an idea and a wealth of experience, some determined people, former executives of the Texas Division of North American Aviation, founded Texas Engineering and Manufacturing Company, Inc.

Known as TEMCO in the Aircraft Industry it has in five short years grown to a place among the leaders in the engineering and manufacture of aircraft. Production ingenuity and manufacturing facilities have resulted in TEMCO being selected to build, in increasing quantities, major assemblies and parts for Boeing Airplane Company, Lockheed Aircraft Corporation and other manufacturers.

TEMCO TEXAS ENGINEERING AND MANUFACTURING CO., INC.

Texas Engineering and Manufacturing Co., Inc.

DALLAS, TEXAS



Three miles from Koto, in the frozen wastes of North Korea, 20,000 U.S. Marines and Infantrymen faced disaster. The only escape bridge across a gorge had been blasted by encircling Communist troops. Without this precious link across the water, our troops would have to abandon their vehicles and detour through enemy infested hills.

Then came the roar of eight giant Fairchild C-119 Packets, and into the frigid air tumbled eight huge steel bridge spans each weighing several tons. The bridge spans were floated gently to earth beneath the billowing canopies of Pioneer-made cargo parachutes. Quickly, the bridge was assembled and the American troops moved across to safety, vehicles and all.

Pioneer Parachute Company is proud that its sturdy cargo chutes helped do the job . . . another Pioneer "mission accomplished" for the forces of freedom!

PIONEER PARACHUTE COMPANY, INC.
MANCHESTER, CONNECTICUT, U. S. A.
CABLE ADDRESS: PIPAR Manchester Conn. U.S.A.

SUBCONTRACTORS meet with Wright engineers to discuss what they can make

WAC Sets Subcontracting Pattern

Wright 'talent scouts' tour the field to find suppliers, setting up on-the-spot displays of needed parts.

By Erwin J. Bulban

A novel scheme to line up subcontractors for its high-priority Turbo-Cyclone and Sapphire turbojet engines has Wright Aeronautical Corp. well along the road toward a record-topping production program.

The plan has proved so successful it has been picked up by the USAF Industrial Planning Division to be expanded by its Procurement districts to aid USAF prime contractors all over the country. It is also being utilized by Army Ordnance in its production expansion program.

Basically the plan calls for specially trained representatives of the prime contractor to go "out on the road" with an exhibit of sample parts to be subcontracted, inviting local business men to look the display over and discuss with them what is needed, and when and how it can be produced. (For story of first USAF show, see AVIATION WEEK Mar. 5, p. 13.) To make the plan really work takes an organization capable of following it through to the actual placement of orders.

▶**How WAC Does It**—Wright's first step was to put production-wise Director of Sales Roger Lewis in charge of its contemplated subcontracting expansion plan. This new setup built three teams of processing engineers, each team consisting of three men, two of them engineers from the Detroit area whose specialty was large volume automotive production. The team leaders were processing engineers from WAC's staff.

The teams were given a two-day intensive training course at Wood-Ridge, N. J. The exhibits, containing parts representing the types of materials used, tolerances, and workmanship required, were assembled. The itinerary was plotted.

To pave the way, WAC's local AF Procurement Field District office, in New York, whose Lt. Col. L. I. Ordway, Jr., had been in on the plan from the start, dispatched memorandums alerting the other PD's serving the areas the teams were to visit. Ordway explained the purpose of the mission, asked cooperation of the offices in making their files available, in contacting qualified local subcontractors, and in setting up room for the displays. The districts were also asked to call on state development commissions and chambers of commerce for assistance.

Then Wright ran advertisements in the local papers in the locality the team was visiting, timed for the day it would arrive. Papers built up interest by running news stories and editorial comment on the project.

The teams set up their displays either at the nearby Procurement District office, or if none is available, in hotel conference rooms. Visiting businessmen are briefed in a group on the desired types of parts and materials, then potential subcontractors are interviewed individually.

The data gathered on these trips is screened. Then Wright engineers visit plants of likely prospects to get further detailed information regarding quality control, prices and so on. At least two or three suppliers are sought on each item—both to guarantee flow in event of sabotage or bombing, and to maintain a competitive price structure.

Where the teams line up shops to make tools for the program, these shops are required to prove their tooling by building parts—which are also fed into the normal production lines.

▶**Initial Results**—Figures on the progress of the teams change from day to day, but some measure of their effectiveness can be found in taking a representative ten-day period covering all the territories. In 16 cities, the exhibits drew a total of over 4000 callers, and subcontractors facilities files collected totaled over 1800. Nearly 1000 of these were found able to fit into the Wright Aeronautical subcontract structure.

A breakdown of employment in firms seeking engine business shows the greatest representation by far is in firms having 100 or less employees. There were over 500 firms having ten or less employes, nearly 900 having 11 to 100 workers, 258 with 101 to 500 and only 106 firms with employment at over 500.

This successful program of rounding up subcontractors and suppliers continues. The number of teams is increasing and Wright has set up permanent offices in Detroit and New York, plans to set up another soon, probably in Boston. Local communities are cooperating wholeheartedly. They see the program's value in maintaining local business stability, which would otherwise slacken off with material shortages. In Detroit, the Park Commission set a new precedent when it gave the Wright office permission to set up an exhibit in a park near the Fisher building.

Back at the home plant, WAC has established a small business department to seek out and work with hundreds of firms whose individual capacity may be small, but taken together represent a large total.

▶**WAC's Policy Switch**—This development in Wright production thinking hinges on the new policy set down by Chairman Paul Shields, since retirement of Guy W. Vaughn.

In World War II, Wright expanded its facilities and employment and thinned its management in an attempt to control the major portion of its war business. In the sorry contract-cancellation days that followed, the company found itself spread out all over the lot when it came to handling the meager postwar aviation business. The thousands of dismissed employes who had been recruited from all over the country, temporarily became displaced persons.

And so, once the current defense spending jigsaw began falling into place and WAC again found itself with a formidable production schedule, a new policy evolved to avoid the pitfalls of the past.

Sparkplugging the scheme is Wright

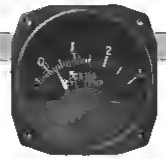
LEWIS

Standard Temperature Indicators for Aircraft

USED BY LEADING AIR LINES, THESE INDICATORS HAVE PROVEN THEIR RELIABILITY BY YEARS OF SATISFACTORY SERVICE

THERMOCOUPLE TYPE

All LEWIS thermocouple indicators are fully cold-end compensated, magnetically shielded and are available for use with iron-constantan, copper-constantan or chromel-alumel thermocouples in all standard ranges for the thermocouple material used. A few typical ranges are listed below



MODEL 17B

MODEL 17B, 2⅜" case to AND 10401
—50 to +300°C Cylinder Temp. (AN 5536-1A or T1A)
—50 to +300°C Bearing Temp. . . .
0 to +1000°C Exhaust Temp.

MODEL 49B

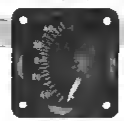
MODEL 49B, 1⅞" case to AND 10403
—50 to +300°C Cylinder Temp. . . .
0 to +1000°C Exhaust Temp

MODEL 76B

MODEL 76B dual, 2¾" case to AND 10401
—50 to +300°C Cylinder Temp (AN 5536-2A or T2A)
—50 to 300°C Bearing Temp . . .
0 to +1000°C Exhaust Temp.

RESISTANCE TYPE

Accurate ratiometers, these LEWIS indicators are remarkably free of voltage error, have nearly linear scales (not crowded at the ends) and are magnetically shielded A few typical ranges are given below Not shown is Model 46B, 2¾" single.



MODEL 47B

MODEL 47B, 1⅞" case to AND 10403
—70 to +150°C AN 5790-6 or AN 5790T6
0 to +125°C Oil Temp . .
—50 to +50°C Air Temp.

MODEL 77B

MODEL 77B dual, 2¾" case to AND 10403
—70 to +150°C AN 5795-6 or AN 5795T6
+30 to +230°F Oil Temp. . .
+100 to +300°C Cylinder Temp

FOR BEST RESULTS USE *LEWIS* THERMOCOUPLES AND *LEWIS* BULBS WITH THESE INDICATORS

THE LEWIS ENGINEERING CO.
NAUGATUCK, CONNECTICUT

Manufacturers of Complete Temperature Measuring Systems for Aircraft

President Roy T Hurley, who came to the company from Ford Motor Co where he had been director of manufacturing engineering Previously, Hurley had been vice president in charge of manufacturing for Bendix Aviation, where he had spent 14 yr. During the war he had been borrowed from Bendix by the Ordnance Department to unsnarl its production problems For Hurley, joining WAC was completing a circle started about 32 yr ago when he had been an aircraft inspector at Wright-Martin, which was later merged with Curtiss-Wright

The extensive subcontracting policy laid out by Hurley, though still in its growing stages is seen making possible aircraft engine production more closely resembling Detroit automotive practices than anything yet seen in the aviation industry By concentrating on two basic engine types, the compound R-3350 and the J-65 Sapphire, and licensing production (R-3350 to Hudson, R-1300 to Kaiser-Frazer, R-1820 to Lycoming Spencer, J-65 to Buick), Wright hopes to get into volume output in a year or a little more, rather than the two and one-half years some say it will take

Stockpiled Tools Speed Defense Work

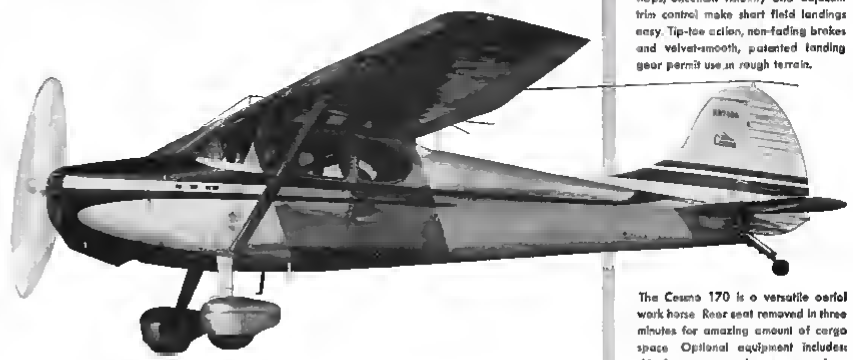
Air Force's peacetime program to stockpile World War II machine tools is now paying off in time saved in expanding aircraft production, Air Materiel Command industrial planners report

Col C W Andrews, resources planning chief at AMC headquarters, Wright-Patterson AFB, Dayton, said that master mechanics from firms such as Kaiser-Frazer, Ford Aircraft division, Wright Aeronautical Corp, and the Army-Navy parts industry committee representing such firms as Parker Appliance Co, Aircraft Fitting Co and Aeroquip Corp have already made selections of tools They will be sent to their facilities from the huge storage facilities in the former Bell bomber plant at Marietta, Ga, and the former Martin bomber plant located at Omaha Neb

Air Force estimated that contractors would be able to go into production within three or four months in many cases by using the machine tool reserve, instead of waiting nearly two years, as would be the case if they had to wait for delivery of new machine tools ordered when the contracts were signed

Approximately 40,000 government-owned tools were pooled in the two plants after World War II. Increases in releases of the tools to aviation contractors began last June and have been mounting rapidly as the USAF's 1951

Lowest Priced 4-PLACE, ALL-METAL PLANE ON THE MARKET TODAY



...by Several Thousand Dollars!

On Display at Your Cessna Dealer's . . .

Cessna 19D SERIES

Big, beautiful, practical and amazingly economical Airline-type engines and airline-comfort! Perfect for large businesses or small ones. 5 place. Cruises over 180 m.p.h. Hamilton Standard Constant Speed Propellers.

** During 1951, the Cessna 170 outsold all other four place airplanes, regardless of price*

This Cessna 170* has four comfortable, adjustable foam rubber seats for long trips . . . plus ample luggage space.

Over 120 m.p.h. cruising speed, 500 mile range, over 15 mile per gallon economy. Simplified maintenance lowers inspection, upkeep costs.

Unique engine mount, spun glass insulation, improved door seal reduce noise, vibration—allow relaxed conversation.

Tapered semicantilever high-wing design gives stability, "big ship" feel, control responsiveness. Selective-action 50° flaps, excellent visibility and adjacent trim control make short field landings easy. Tip-toe action, non-fading brakes and velvet-smooth, patented landing gear permit use in rough terrain.

The Cessna 170 is a versatile aerial work horse Rear seat removed in three minutes for amazing amount of cargo space Optional equipment includes: skis for winter service . . . seaplane floats for water operation . . cross-wind wheels for single-strip all-wind conditions . . . stretcher for ambulance use . . spraying equipment for crop protection.

Cessna 170

MAIL THIS COUPON NOW!

Cessna Aircraft Co.
Dept AW-2, Wichita, Kansas

Please send free literature giving complete description of the Cessna 170

Name_____

Address_____

City_____ State_____

Firm Name_____

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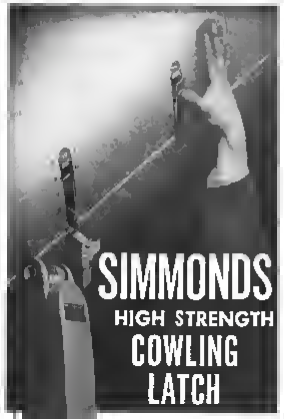

Can take quite a beating **AND** *You can't beat it for . . .*

- **POSITIVE LOCKING**
- **FLUSN FITTING**
- **TOGGLE ACTION**
- **NIGH SHEAR LOAD**
- **DURABILITY**

This compact, light Cowling Latch assures a flush exterior at all times and is unusually simple in operation. There are no loose parts, just a housing and a toggle assembly.

Four sizes accommodate all cowling curvatures from 23 inches diameter to flat. Suitable for either hinged or detachable panels. Positive safety lock. Just four bolts required for installation.

The Simmonds High Strength Cowling Latch weighs from 6 to 8 ounces and carries an ultimate load of about 7,000 pounds in tension and 9,000 pounds in shear.

Although designed for engine cowlings, this unique device is finding practical applications on cargo doors, access panels, armament compartments, propeller spinners and other places where high strength fastening is required.

Our engineering and development division is ready to study your aircraft fastening problem and adapt this product to your standard or special requirements. We will be glad to send complete details and specifications.

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procurement program expanded. In January the tools were being shipped from each of the plants at the rate of 100 a week, and it is expected this rate would be doubled in March.

As soon as the plants are emptied of stored machine tools, they will be occupied by aircraft manufacturers. Lockheed Aircraft Corp. has already arranged to take over the Marietta plant, but the assignment of the Omaha plant has not yet been finalized.

The tools, valued at approximately $400 million, were acquired by the Air Force in 1946.

They were transferred from War Assets Administration, under the Joint Army-Navy Machine Tool Program (JANMAT), after they had been transferred to WAA by Defense Plants Corp., a division of Reconstruction Finance Corp. DPC had purchased the tools originally for lease and use by government contractors during World War II and they reverted to DPC after contract termination.

The following routine has been set up by AMC for utilization of stored tools:

Contractors with the Air Force are invited to "borrow" any of the tools available that they may need in performing their contracts. They may make their selections by visiting Wright-Patterson AFB where catalogs of the tools are available for their study. Tools are shipped on request when plants are ready for their use, with ownership retained by the government.

After completion of the contracts, or subsequent contracts, and in any case at the end of the present emergency, the tools are to be returned to the Air Force for storage.

GM Units Work on Aviation Contracts

The extent to which General Motors Corp. has gone into aviation production was indicated last week by the company's 1950 annual report. Of the giant company's 34 manufacturing divisions, 13 have prime or sub contracts for aviation items. These are:

- AC Spark Plug—Navigational instruments and bombsights.
- Aeroproducts—Actuator gear boxes, assemblies, and propellers.
- Allison—Turbojet and turboprop engines.
- Buick—J-65 Sapphire jet engines.
- Buick-Oldsmobile-Pontiac — Republic F-84F jet fighters.
- Chevrolet—Allison J-35 turbojet engines.
- Frigidaire—Propeller parts and jet engine parts.
- Delco Products—Landing gear.
- Hyatt Bearing—Bearings.
- Packard Electric—Wiring harness.
- New Departure—Bearings.
- Diesel Equipment—Aircraft components.

All of the remaining GM divisions have non-aviation defense orders. The company's total defense backlog is more than $3 billion, two-thirds of which has been booked since Dec. 16. This backlog is nearly equal to one-quarter of GM's 1940-1945 war production of $12.3 billion.

USAF Awards

Air Materiel Command Procurement Division makes available to AVIATION WEEK recent bid awards, shown on this page. Requests for further information should be addressed to Contracting Officer, AMC, Wright-Patterson AFB, Dayton, Ohio, attention MCPPSX72.

ABSTRACTS

For 4 grinders (51-1219):
Abrasive Machine Tool Co., East Providence, R. I., on a bid of $9584.

For valve seat (51-1227):
Companies sharing: Neal Machine & Tool Co., Lima, O., on a bid of $7069.28, and Blackhawk Mfg. Co., Milwaukee, on a bid of $368.

For steel-chrome nickel (51-1240):
Tebo Distributors Co., Inc., Brooklyn, N. Y., on a bid of $13,140.93.

For 8 trucks (51-1301):
Colson Corp., Elyria, O., on a bid of $2848.

For indicators (51-1278):
General Electric Co., Schenectady, on a bid of $48,928.

For indicators (51-1295):
Liquidometer Corp., Long Island, N. Y., on a bid of $98,720.68.

For funnel & screen assemblies (51-481):
Companies sharing: S. G. Adams Co., St. Louis, on a bid of $3686, Dover Stamping Co., Fall River, Mass., on a bid of $5688.40, F. H. Lawson Co., Cincinnati, on a bid of $1080, Hoffman Mfg. Co., Dayton, on a bid of $7078, and New Delphos Mfg. Co., Delphos, O., on a bid of $880.

For capacitors (51-813):
Companies sharing: Aerovox Corp., New Bedford, Mass., on a bid of $1910.15, Tobe Deutschmann Corp., Norwood, Mass., on a bid of $1197.78, Neptune Electronics Co., New York, on a bid of $238.8, Radio Wire Television, Inc., New York, on a bid of $456, and U. S. Radio & Television Supplies, Inc., Chicago, on a bid of $264.

For ammeters and voltmeters (51-800):

For refueling and loading ladders (51-804):
Griffith Ladder Mfg. Co., Malden, Mass., on a bid of $18,913.85.

For generators (51-808):
General Electric Co., Schenectady, on a bid of $249,147.50.

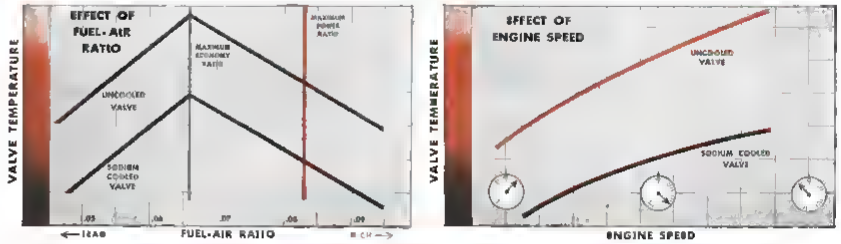
For louvers (51-899):
Companies sharing: San Angelo Foundry & Machine Co., San Angelo, Tex., on a bid of $70,880, and Parish Mfg. Co., Millsdale, Conn., on a bid of $8,400.

For 6800 bell assemblies (51-900):
Aerial Machine & Tool Corp., Long Island City, N. Y., on a bid of $27,280.

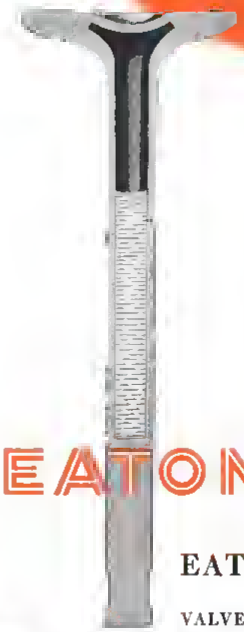
For apron and gloves (51-892):
Companies sharing: Rohlik, Inc., Detroit, on a bid of $2205, and Johnson Bros. Shoe Co., Inc., St. Louis, on a bid of $8995.

For aircraft cable (51-1043):
Companies sharing: Packard Electric div., General Motors Corp., Warren, O., on a bid of $8877.55, and City Electric Distributors, Inc., New York, on a bid of $3333.50.

For gloves (51-1918):
Companies sharing: J. M. Rubin & Sons, Gloversville, N. Y., on a bid of $44,883.80, and Makegood Mfg. Co., New York, on a bid of $4765.80.



The Effectiveness of Sodium Cooling



In considering factors which influence exhaust valve life, temperature is the dominant one. High temperatures sharply reduce the resistance to corrosion, distortion, and fatigue life of the finest alloy steel. The effectiveness of sodium cooling in reducing valve temperatures is shown by the curves above, typical of recorded test data.

The curve "Effect of Fuel-Air Ratio" shows that as the mixture is leaned out to obtain maximum economy, valve temperatures rise. The curve showing "Effect of Engine Speed" indicates that temperature rises rapidly as speed increases.

EATON

Eaton engineers will welcome an opportunity to discuss the application of Eaton sodium cooled valves to engines proposed or now in design.

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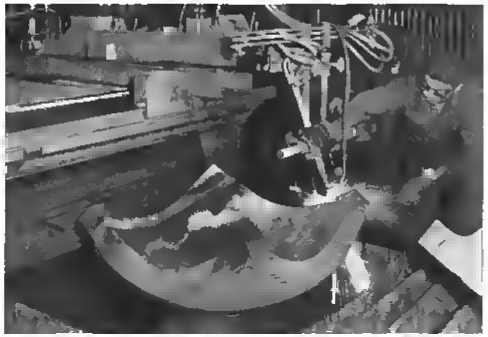
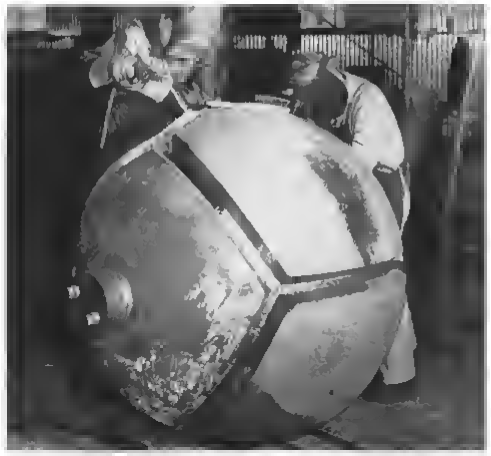
VALVE DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS. Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springbites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



FORMING operation for sphere's steel plates used punch and die. To save time . . .

TRIMMING and beveling were handled in one operation with flame cutting equipment. With segments assembled . . .



WELDING is done with multiple pass arc procedure, using about 100 of rod. For progressive welds, technician does . . .

INSPECTING with Dy-Chek, a red surface penetrant highlighted with developer.

Steel Ball Holds Nitrogen at 5500 Psi.

Welded Nitro-Sphere for servicing AF rocket-powered craft, will weigh about 7500 lb., hold 200 hal.

A new design concept for high strength pressure vessels has been prompted by the exacting demands of rocket propelled aircraft.

Result is a new welded steel spherical chamber forming part of a ground storage and manifolding system for servicing nitrogen to USAF experimental rocket-powered craft.

► **Stainless Steel Makeup**—Design of the vessel, known as Nitro-Sphere, is based on an "exploded" cube layout, chosen because it appeared to offer the best strength potential.

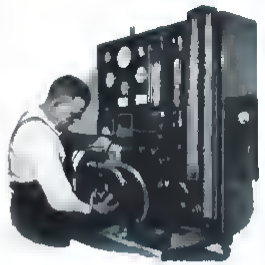
It will hold with considerable safety margin 200 gal. of liquid nitrogen at 5500 psi at −340 F. Material is 11/16-in. stainless steel plate and the sphere is 54 in. in diameter. Weight of the unit is approximately 7500 lb. Alternate proposed designs, providing for a barrel-type structure, would have ranged up 15,000 lb.

► **Plates Formed at 1700 F**—Supplier of the complete system, Research

PAC *engine overhaul means singing, surging power*

PAC *engine overhaul means more time between overhauls*

PAC *quality workmanship sets the standard of the industry*



PAC *testing methods mean increased efficiency of operation*

Engine Overhaul Efficiency . . .

. . . is not only essential to safety standards, but can increase operational profits as well. For example, Pan American reports that one run is getting 1500 hours between overhauls on R-2000 engines. PAC engine overhaul efficiency also helps Pan American's giant 4360 – 3500 hp engines to get 900 hours between overhauls. Maintenance men and Air Force Engineers throughout the country consult with PAC engineers and craftsmen to study these methods. Incidentally, Pacific Airmotive is the only privately owned concern in the country authorized to overhaul these 4360 engines. The CAA has also approved the 25% saving of test-run time, as pioneered by PAC engineers.

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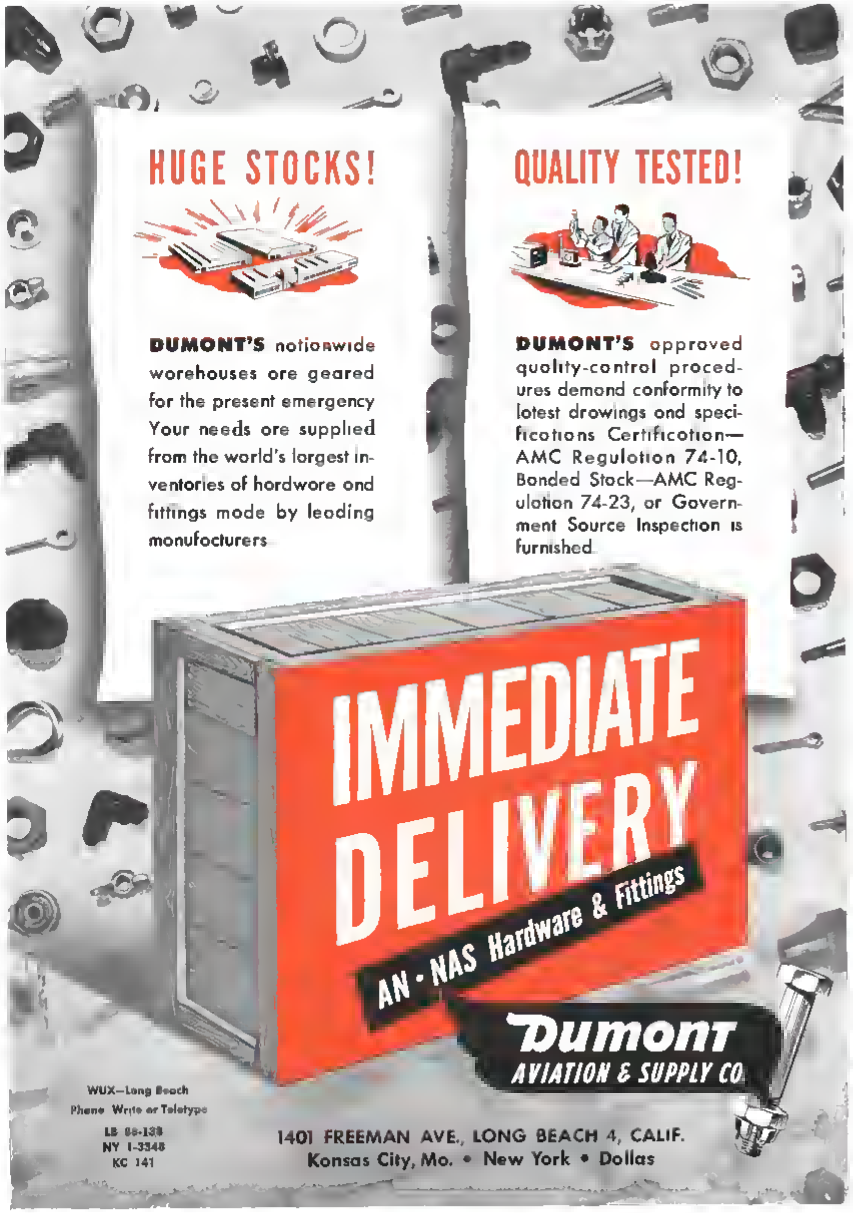


Welding and Engineering, South Gate, Calif., directed the design of the pressure sphere and its fabrication process.

Six 3 687 x 38 x 38-in. stainless steel plates were supplied by Allegheny-Ludlum which rolled them as a special lot from 347 ASTM-A240 grade C stock.

To form the plates to a 22 500 in. radius, National Supply Co. prepared a special die and punch, pressing the stock after preheating it to 1700 F.

►**Segments Fitted**—Research Welding and Engineering then laid out the plates to permit trimming and beveling in the same operation. Trimming was done by Jorgensen Steel Co. with flame cutting equipment. A heavy duty grinder removed slag and residue from the trimming operation. Parts were pickled to avoid contamination.

The sphere segments were fitted and held together temporarily with thin backing plates. Research specified the welding procedure.

►**Welding, Inspection**—First passes were made by the heliare method. The weld was inspected with gamma ray and Dy-Chek methods. The latter, devised by a Northrop Aircraft, Inc. subsidiary, employs a red dye surface penetrant and white developer to show up minute flaws (AVIATION WEEK July 17, 1950).

In the next step, the joints were filled by multiple pass arc welding. Gamma ray and Dy-Chek inspections were repeated several times as the welds were built up.

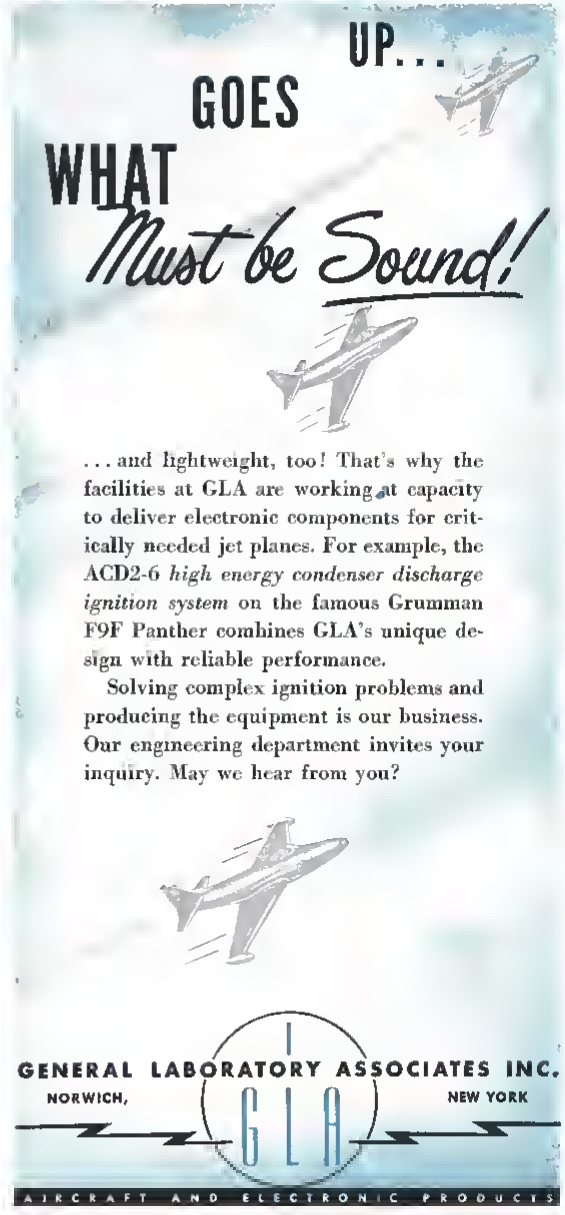
General Electric type 1347, 3/16-in. coated electrode metallic arc rod was used. Almost a ton of weld rod was consumed for the job.

►**Final Steps**—Another operation was heat treat for fully annealed condition. The sphere was brought to 1950 F. for 3½ hr., then subjected to quenching both inside and outside with jets.

Hydrostatic test proved the sphere at 10,000 psi. in Research's facilities. Then came a final examination with gamma ray and Dy-Chek.

Where to Locate V-Type Antennas

A recent report gives the best location for the V type radio antenna on most small planes. It was found to be over the forward part of the cabin, according to a study made for CAA on nine planes by Electronics Research, Inc., Evansville, Ind. Unshielded ignition was the worst offender in producing disturbances. The complete report—VHF Radio, VHF Omnirange Radio Installation and Noise Reduction Techniques—can be had by writing the Office of Aviation Information, CAA, Washington 25, D. C.



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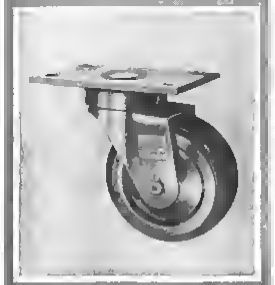

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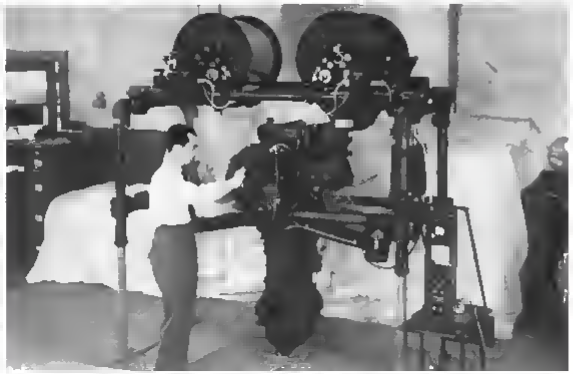

ROTATING PRISM is unique feature of Perkin-Elmer's Panoramic Camera

Camera Sees Like Moving Eye

Scanning prism sweeps wide field of view into the fixed lens and onto film strip a mile long.

A giant aerial camera "radically" different from its predecessors and capable of performing tasks previously requiring the use of a whole battery of cameras has been developed for the Air Force by the Perkin-Elmer Corp., Norwalk, Conn.

The camera is designed specifically for photo reconnaissance. It has a lens of very high resolution. While the new model produces pictures of high clarity, there is slight distortion, so it's not intended to use it for mapping purposes.

The "Transverse Panoramic Camera," as it is called, is a big camera designed to do a big job. Its primary mission: The filming of great land masses with greater speed, economy and efficiency than possible heretofore.

▶**Pa in a Day**—Carried in a plane at 40,000 ft., the camera could photograph in sharp detail the entire state of Pennsylvania in less than one day on one roll of film, say engineers who built it. At this altitude, railroad ties and shadows of telephone poles will show up separately and clearly, they assert. The camera's huge spools, which must be lifted in place by a winch, can carry film 1¼ ft. wide and about a mile in length.

The camera does not move. Its lens has a narrow field of view. But still it can photograph through an extremely wide angle—up to 180 deg. of terrain, from horizon to horizon, on a single unbroken strip of film. According to Perkin-Elmer and Air Force spokesmen, the new unit is the only fixed, single unit that can photograph 180 deg. This compares to an angular coverage of only 38 degrees attained with two K 22, 40-in. lens cameras now used in the RB-29.

The instrument, actually a strip camera with a new bag of tricks, films across the line of flight, instead of along the flight path. It uses only one roll of film, replacing a number of rolls used in multi-camera systems. In place of 40-in. lenses now commonly used by the Air Force for panoramic photography, the camera is equipped with an extra large 48-in. lens with an opening of f/8. As a single, compact unit, it is about one-third the weight of a battery of cameras capable of performing a roughly similar task. Without film it weighs under 1000 lb. A film roll weighs up to 400 lb.

▶**How It Works**—How does the camera take pictures covering a wide field of view with a lens that is fixed and has a narrow field of view? It works by means of a huge scanning prism which mirrors into the lens a sweep of terrain stretching far beyond the lens' field of view.

The scanning prism, pivoted at the bottom of the camera and hanging in a three section window in the belly of the plane, sweeps the terrain below in a stroke which starts at the horizon off one wingtip and follows through to the horizon off the opposite wing. The ground image is fed into the lens and "wiped" onto film moving in exact synchronization with the moving prism. This produces a long, narrow picture showing terrain through an angle 20 deg. fore and aft of the plane and 180 deg. laterally. After a sweep, which is

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All twin engine fighters for the Navy's newest carrier-based jet squadrons are powered by the J-34. This light and slim Westinghouse engine lends itself ideally to a twin engine installation which in turn provides the reassuring safety factor of single engine operation in times of emergency.

The designers of these airplanes chose the J-34 because it combines high power with low weight. These features plus the power, dependability and performance of the engine assure that the air striking force of the United States Navy will be second to none.

J-54003 B

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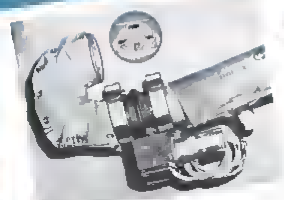
ENGINEERS' NOTEBOOK



V-Bond Couplings simplify Hot Air Voive Installotion on Lockheed F-94

Electrically operated hot air valves used on Jet engines demand a joint seal that will withstand high temperatures and pressures Ideal solution employed on Lockheed F 94 Hydro Air Valve illustrated, is a Marman V-Band Coupling. This lightweight, compact joint easily withstands pressures as high as 400 p s i, and temperatures of 450° F At the same time it is quickly detachable for fast assembly and disassembly—saves weight, space and cost

Rigid High Strength Connection for Jet Aircroft Fuel Filter

Marman V-Band Couplings are also utilized to connect fuel filters on Lockheed F-80, F-94 and T-33 series. Tested at 150 p.s.i. these connections provide a positive seal under vibration and stress.

Marmen V-Band Couplings are usable for all types of flanged joints Standard types available for wide range of temperature, pressure and strength requirements.

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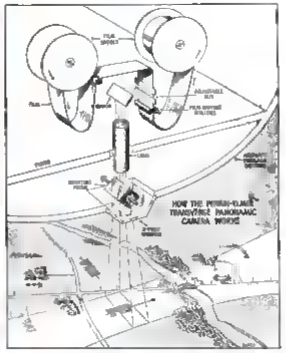

FILM STRIP moves to synchronization with sweep of the scanning prism

always in the same direction, both prism and film automatically stop for a short period, allowing the plane to move forward for another picture.

The scanning prism automatically repeats the scan, in time enough so pictures overlap to give a continuous scene along the line of flight and to permit stereoscopic study of ground objects

The prism can be adjusted to start and stop so it scans laterally from 60 to 180 deg as desired. Exposure from 1/50 to 1/1000 sec is controlled by adjusting the width of the film slit

During intervals between scans, the spool feeding film slowly builds up several feet of slack. When the prism starts to sweep, special rollers grab and yank slack film past the exposure slit

Each scan produces pictures two to 12 feet long, depending on altitude and other factors Only a two in length of film is exposed at any instant in the operation of the camera Each picture is separated from the next one by a narrow two-in margin There is no film waste The camera can take up to about ten pictures a minute and is equipped with two aero filters which are built in

The camera is scheduled for early flight trials in a heavy bomber-type reconnaissance plane It is designed primarily for use in such planes as the RB-36, RB-50, and RB 29 But Perkin Elmer adds significantly "Its usefulness is by no means confined to large airplanes Its weight and bulk-saving features, combined with the fact it provides wide, lateral photo coverage make it especially valuable for use in small fighter type aircraft such as the F-84 or the F-86."

The company's engineers told AVIATION WEEK the present model, a prototype, will lend itself to considerable streamlining. It can carry smaller spools,

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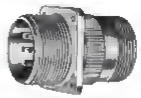

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and even as now designed can operate on as little as 20 ft. of film.

While it was developed primarily for high altitude, panoramic photo reconnaissance, there is an indication the camera—or at least models based on its design—might become a standard, all-purpose photo-reconnaissance tool. This is supported by Perkin-Elmer's statement that 'shorter focal length lenses will be used for medium and low altitude photography.'' Use of wide angle cameras of this type for low altitude detail photos could minimize chances of missing the target to be filmed.

The design was conceived by Dr. James C. Baker of Harvard University. The camera was built by Perkin-Elmer in cooperation with the Photographic Laboratory, Engineering Division, Air Materiel Command, Wright Field. Perkin-Elmer specializes in "custom" manufacture of high quality optical and electro-optical equipment. Astronomical telescopes designed and constructed by the company are used in a number of the leading observatories in the world, it points out.

Study Delta Wing, Supersonic Flow

The interest in delta winged aircraft for flight at low supersonic speed has touched off a number of supplementary investigations in theoretical aerodynamics. One of these has been summarized by the National Advisory Committee for Aeronautics in Report 939 (Theoretical Characteristics in Supersonic Flow of Two Types of Control Surfaces on Triangular Wings, by Warren A. Tucker and Robert L. Nelson of Langley Aeronautical Lab.)

In the report, two basic types of control surfaces are studied. Constant-chord, partial-span surface (extending either inboard from the tips or outboard from the centerline) and full triangular-tip surface, located at the wingtip, and of a planform geometrically similar to the wing.

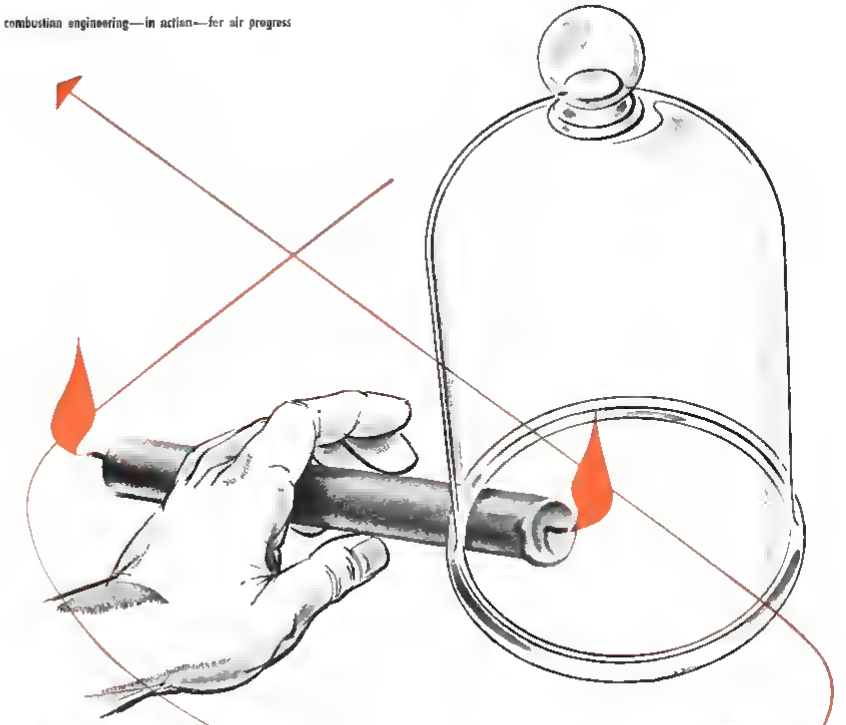
The analysis is a theoretical one, using methods based on linearized equations for supersonic flow. Results are subject to the limitations of such an analysis, and viscous effects have also been neglected.

▶ **Five to Find**—Control surface characteristics generally determined for comparative evaluations of types include:

- Lift coefficient due to flap deflection.
- Rolling-moment coefficient due to flap deflection.
- Pitching-moment coefficient due to flap lift.
- Hinge-moment coefficient due to flap deflection.
- Hinge-moment coefficient due to angle of attack.

Any of these characteristics can be

combustion engineering—in action—for air progress



we've been burning our candle at both ends

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FLIGHT AND NAVIGATION INSTRUMENTS

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Dual Radio and Magnetic Compass Indicators
Gyro Flux Gate* Compasses
Magnetic Compasses
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Turn and Bank Indicators
ODR-Components

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Control Panels
Fault Protection Systems
Generators
Inverters
Line Relays
Overvoltage Protectors
Reverse Current Cutouts
Voltage Booster Dynamotors
Voltage Regulators
Power Failure Indicators

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found, given pressure distributions of flap deflection at constant angle of attack, or angle of attack at constant flap deflection.

Comparison of inboard and outboard constant-chord surfaces shows that small-chord, large-span surfaces are the most efficient when lift per unit hinge moment is used as the criterion. This is consistent with subsonic experience.

A curve plotting the product of flap deflection and lift coefficient due to flap deflection shows that there is an optimum span ratio which gives the greatest rolling moment effectiveness. For the special case of the supersonic leading edge, this optimum ratio defines a surface which is a half triangular tip control, rotating about an axis normal to the airstream.

▶ **Related Flaps**—A constant-chord, full span control surface and a half triangular tip surface are opposite limiting cases of the constant-chord, partial-span flap. Further, the half triangular tip surface can be regarded as belonging to the family of which the full triangular-tip surface is also a member.

A comparison of these three types of control surfaces was made, using curves of lift coefficient and rolling-moment coefficient due to surface deflection. The comparison showed that at supersonic Mach numbers in excess of 1.4,

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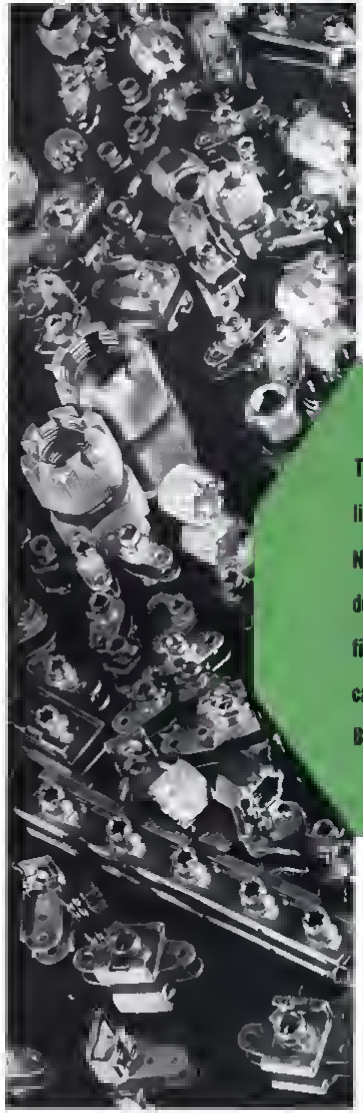

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there was no difference in the available lift coefficient from the three surfaces. However, the rolling moment plot showed that the triangular-tip surfaces were about 50 percent more effective over the Mach number range above 1.4, and that below Mach 1.4, the choice was made difficult by converging characteristics.

These curves, having been derived from linearized theory, are applicable only to wings of zero thickness. Thickness will decrease the effectiveness of the constant-chord surface. However, streamwise sections of the triangular-tip surface would appear more as complete airfoil sections than as control-surface sections. Thickness effects on airfoil lift are small, so it could be expected that the effectiveness of the triangular tip surface would change very little due to thickness.

Therefore, it would seem that the use of triangular-tip surfaces on a wing of finite thickness would show effectiveness improvements of more than 50 percent over the constant-chord type.

▶ **Hinge-Moment Predictions**—Theoretically, the hinge moment will be zero for triangular tip controls if the hinge line passes through the surface center of area and is parallel to the trailing edge. In a practical sense, the chordwise location of the center of pressure would probably not be exactly at the center of area, and it will also probably shift somewhat with Mach number.

In any event, the problem of hinge-

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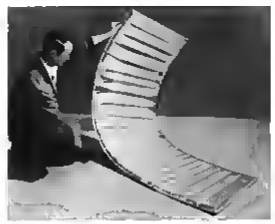

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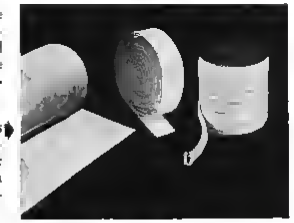

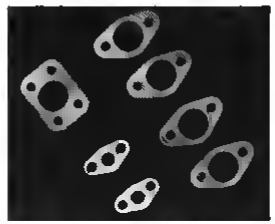

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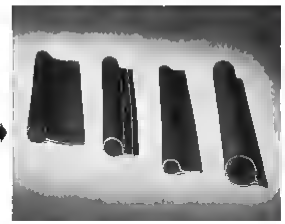

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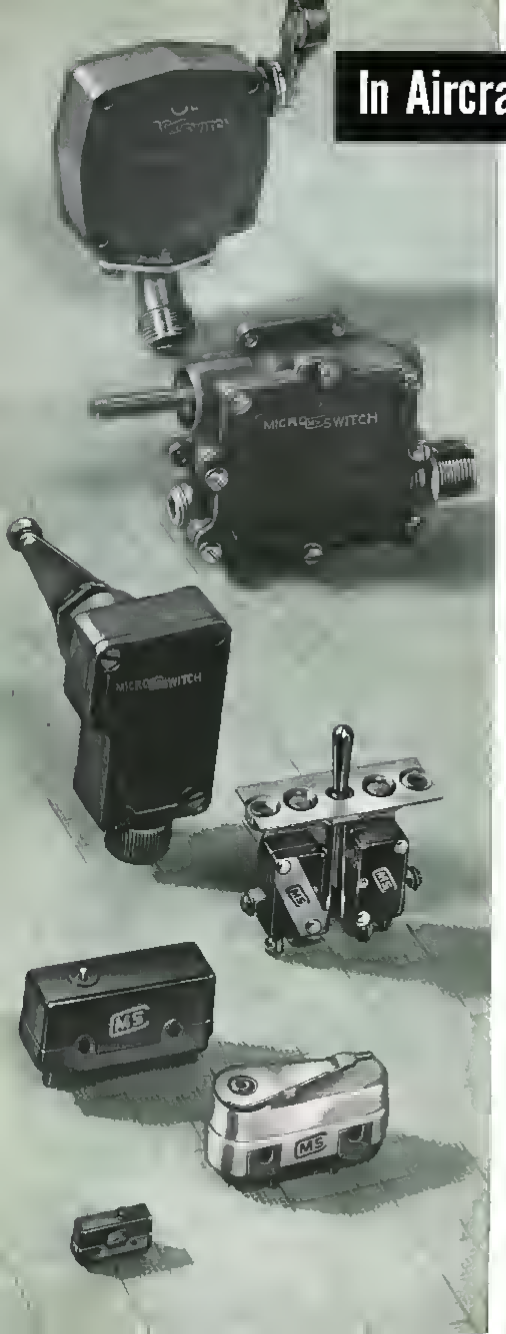

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Shown at the left are but a few of the many MICRO precision switches designed to conform to rigid "AN" and "MIL" specifications. They have long proved to be dependable components for such applications as: screw jack limits, landing gear limits, wing fold limits, wing lock indicators, flap limits, throttle warning, cockpit lighting controls, gun turret limits, fire control masking, radar and radio, door interlocks, propeller control devices, fire fighting devices, fuel metering devices and barometric pressure devices.

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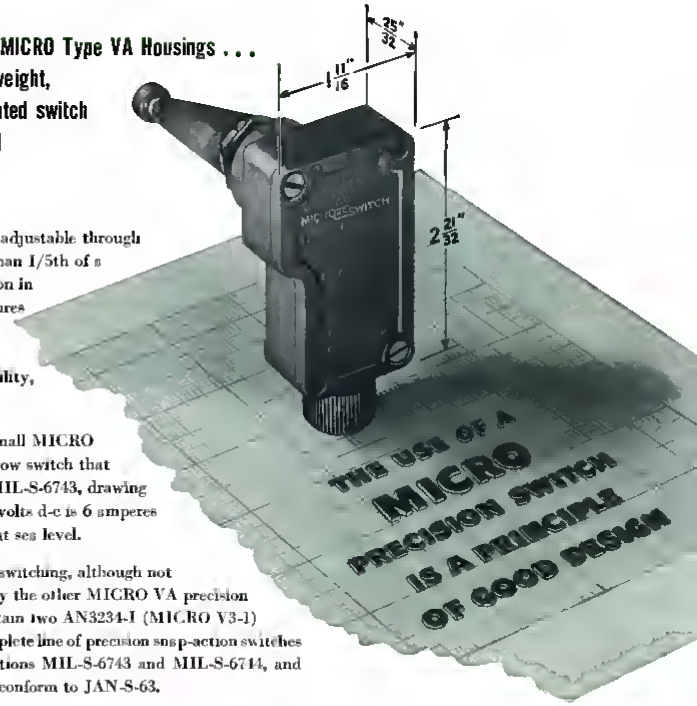

The rotary actuator arm is adjustable through 360° in increments of less than 1/5th of a degree, with switch operation in either direction. Other features include winterization; protection from dust, dirt and splash, easy wiring accessibility, and easy mounting.

The switching unit is the small MICRO V3-1 single-pole, double-throw switch that conforms to Specification MIL-S-6743, drawing AN3234-1. Rating at 28.5 volts d-c is 6 amperes at 50,000 feet, 10 amperes at sea level.

Double-pole, double-throw switching, although not simultaneous, is provided by the other MICRO VA precision switch housings. These contain two AN3234-1 (MICRO V3-1) switches. MICRO has a complete line of precision snap-action switches which conform to Specifications MIL-S-6743 and MIL-S-6744, and many switches designed to conform to JAN-S-63.

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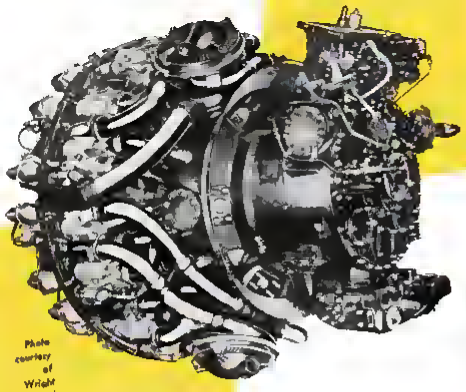

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moment balance will be less serious for the triangular-tip than other surfaces

Centrifuge Developed For 40-G Force

A giant centrifuge is being built at the Naval Air Development Center, Johnsville, Pa., to afford more precise data in acceleration physiology studies.

In this new facility, a research program will be conducted by the Navy's Aviation Medical Acceleration Laboratory and the University of Pennsylvania's medical school, to investigate flight forces on humans

In addition, the high G level of the centrifuge will help in the evaluation of rocket and missile components

Other centrifuges in existence, relatively small, have radius arms varying in length from about 10 to 20 ft and are considered to have an inadequate acceleration rate for development of G forces directly comparable to those exerted in dive bomber pull-outs

The new centrifuge will have a 50 ft arm carrying at its end a streamlined gondola (cockpit) 10 ft. in diameter. Power for rotation will be an electric motor capable of producing 40Gs at the gondola, which will house equipment for dropping internal air pressure to simulate 60,000 ft altitude, and for varying temperature between 40 and 110 F.

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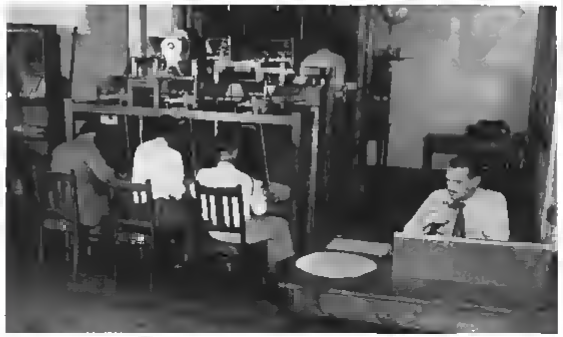

SIMULATOR room with pilots' cubicles at left, controller in right foreground. Projector heads above pilots' plotting boards cast light spots on projected map

Unit Simulates Traffic Problems

Australian device trains ground control officers, pilots; ANDB studying similar equipment here.

(McGraw Hill World News)

Melbourne—A unique air traffic simulator is in use here for training ground control officers of the Australian Department of Civil Aviation. Pilots and ground control personnel, supervised by an instructor, can duplicate the problems of several aircraft in an approach to a terminal area, including any emergency procedure

According to the U. S. Air Navigation Development Board, the Australian simulator is the only one of its kind, although ANDB is studying a less complicated one

The simulator was designed at the Radiophysics Laboratory of the Commonwealth Scientific and Industrial Research Organization by T. D. Newnham, under the supervision of Dr. E. G. Bowen. This group was interested in investigating air traffic procedures under various radio range systems. But a few trials showed the simulator to be of even greater value in the training of ground personnel

▶**Nine Fly for Two**—The simulator accommodates nine pilots and two controllers. Each pilot is assigned the altitude, time and direction to enter the outer control zone by the first controller. Upon flying into the zone, the same controller issues flight clearance to the inner control zone. Here the second controller takes over and gives clearances for final approach

For these flight problems, the pilots sit in small cubicles and steer a projector over a chart of the terminal area. The projector casts a spot of light on a screen which is behind the pilots and which also represents the terminal area. Thus, the supervising instructor and the ground controllers have a composite picture of the motions of all aircraft in the terminal zone. This picture is analogous to a radar plan position indicator display

▶**Variable Controls**—There is an automatic speed setting arrangement on the pilots' projectors which varies the speed of the simulated aircraft in 30 mph intervals between 60 mph and 300 mph

Calibration changes in speed can be made to account for different scales on the terminal area charts. A similar adjustment allows a multiplying factor to be set into the speed selector switches to simulate the higher speeds of jet aircraft

A wind drift mechanism has been devised, but is not yet incorporated in the simulator

Air ground and ground-air communication is simulated by an intercom system

Transmission and reception take place on different channels, so one pilot cannot eavesdrop on another's transmission. Pilots communicate separately with the outer control zone and airport controllers, and the two controllers can

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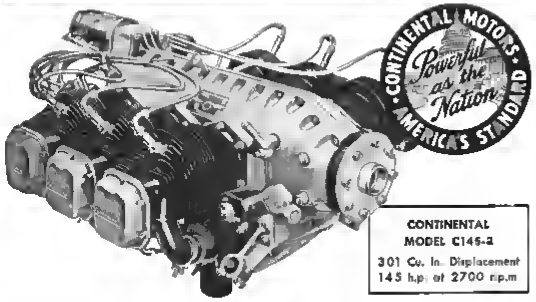

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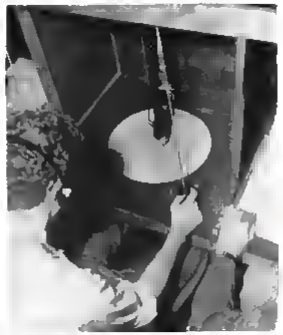

PILOT flies simulated aircraft through traffic pattern at terminal. Right hand is on steering control, central column leads to projector head

talk to each other over a separate channel.

Trainees alternate as pilots and controllers.

▶ **Planning Flights**—When a new problem is set up, pilots and controllers are briefed as to the general nature, the navigational aids to be available and the holding procedures. Usually two types of aircraft—DC-3 and DC-4—are simulated.

During the experiment, pilots keep a log sheet with flight changes and the text of all instructions. They obtain time readings from a common clock on the wall.

Accuracy and care with which pilots keep their logs determine the worth of the experiments, since final deductions are based solely on the data taken from the log sheets.

Use of the simulator has shown that direct comparison between flight times of real and simulated aircraft can be made, provided that navigation, position reporting and air-ground cooperation were adequately represented.

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A low-frequency range and broadcast radio for lightplanes, featuring a "pancake" or flat configuration so it may be installed in a small space in or below the instrument panel is being produced by National Aeronautical Corp., Wings Field, Ambler, Pa.

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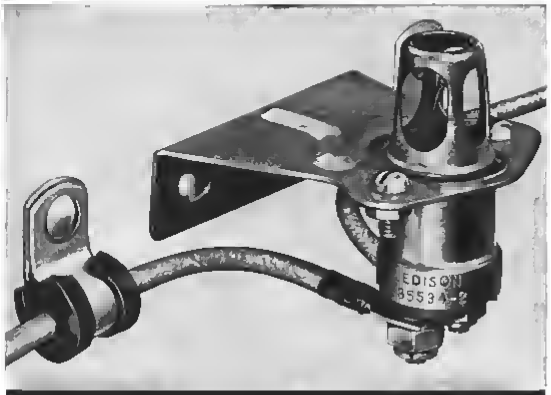

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The traffic control monitor, a joint project with Watson Laboratories and USAF, was developed and delivered by the Los Angeles firm in four months, is now being evaluated at the CAA Technical Development Station at Indianapolis. It is expected to be ordered in quantity. A CAA traffic control expert reportedly has said: "We could use 100 sets right now."

Coupled with the Precision Approach Radar Model PAR 1, the traffic control monitor keeps track of three aircraft simultaneously from 10 miles to touchdown. It performs these tasks automatically:

- Indicates position of each aircraft.
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- Advises traffic control personnel when the nearest aircraft is a predetermined distance from touch-down.

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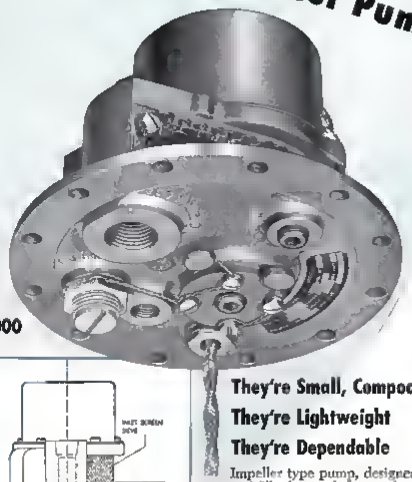

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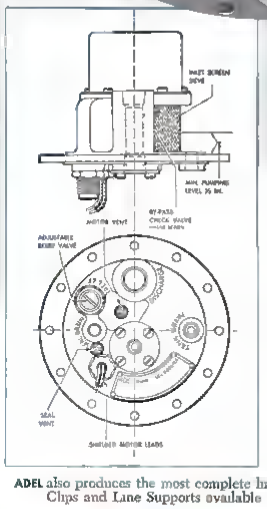

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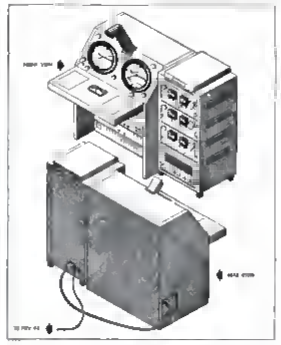
CANADIAN REPS: RAILWAY & POWER ENGINEERING CORPORATION LIMITED



VIEW shows compactness of monitor

landing aircraft is given by the automatic equipment

▶ **Information Displayed**—Information given out by the automatic traffic control monitor can be displayed on meters next to GCA equipment, in the Air Traffic Control Center, in the chief tower controller's office, and in the airport control tower for traffic control personnel.

But installation of the monitor itself is limited. For use with GCA it should be placed as close as practical to the cathode ray tube display unit, and at the point of greatest convenience to the operator. The display panel of the traffic monitor must be placed to allow rapid correlation of data between the display of the radar equipment proper and the monitor.

While the monitor was designed to supplement Gilfillan's Precision Approach Radar (GCA) Model PAR-1, it can also be operated with CPN-4 and FPN-16 GCA equipment developed and now being produced for USAF by Gilfillan.

▶ **Operating Details**—Here is how the traffic control monitor in combination with PAR-1 operates.

The return pulses of aircraft entering the 10-mile range of the monitor may be bracketed on the radar screen by two locally generated gates, which are adjusted by means of manual slewing control. Once the return pulses are bracketed and the traffic control monitor is set to the tracking function, the visual gates will continue to encompass the landing aircraft during its approach along the glidepath. These electronic tracking gates can be set for distance.

The function of the monitor's three range tracking units are independent of each other, and any three aircraft within the 10 mile range may be tracked at a given time. Two display meters on each of the tracking units indicate range to touchdown and ground speed respectively of the aircraft being tracked by that unit. Other features are:

• **Removal of the visual** presentation of the tracking gates of each tracking circuit from the cathode ray display of the precision approach radar equipment without affecting the operation of traffic control monitor tracking circuit.

• **Velocity "memory,"** whereby the gates bracketing the aircraft move between radar "hits" at the previously determined radial velocity of the tracked aircraft. The memory of the circuit operates for a maximum period of 5 seconds after which, if the signal is still absent, the tracking gates come to rest and a red light and a bell are actuated.

• **Minimum memorized velocity** (minimum coast speed) within a predetermined range reduces the tendency of the range tracking circuit to lock on ground clutter. This minimum velocity is set at 50 knots at ranges from touchdown to an adjustable maximum of 5 miles.

• **Warning buzzer** and an amber panel light operate if the radial spacing between successive aircraft becomes less than a value adjustable between 1 and 4 miles.

• **No-take-off** chime and white panel light operate when an aircraft reaches an adjustable predetermined range, variable between 1 and 5 miles.

Equipment for automatically monitoring three aircraft simultaneously is assembled in a four section caster equipped cabinet. Overall dimensions are 22½ in. wide, 19 in. deep, and 47 in. high. Net weight is 300 lb.

Each of the three upper sections of the cabinet houses a range tracking unit, which is easily removable for inspection and maintenance. A memorandum pad is beside each tracking unit so traffic control people can mark identity of planes monitored.

The lower section of the cabinet houses the monitor's power supply, which supplies voltages for each of the three range tracking units. It operates on 110-112 v. 60 cycle ac supply. Outputs required for all three tracking units are as follows: plus 300 v. dc, plus 150 v. dc, minus 150 v. dc, and 6.3 v. ac. 2-amp. supply. A 110-120 v. ac fan is located on the top of the cabinet.

A cable for interconnection of the traffic control monitor and precision approach radar Model PAR-1 is supplied.

Because of the urgent need of the automatic traffic control monitor, Gilfillan was asked by Watson Laboratory to develop, produce and deliver it in five months. Gilfillan did the job in four months, starting from scratch.

Total cost of the engineering, development and production was under $12,000. It is expected that in quantity production the complete equipment will cost less than $4500.

FOR MAXIMUM **JET POWER**

Stainless steel nozzle assemblies for jet aircraft engines. ABOVE: nozzle tip assembly. ABOVE, RIGHT: duplex nozzle assembly. TO RIGHT: dual flow nozzle assembly. All details of these units have been manufactured and assembled by Ex-Cell-O to the rigid specifications of the aircraft industry.

Ex-Cell-O Precision Parts

Working in stainless steel to customers' rigid specifications, Ex-Cell-O is actively engaged in production of jet aircraft nozzle assemblies. This is but one of the latest developments in a long-standing program of service to the aviation industry. The result, engine, propeller, or fuselage of practically every plane produced in this country has parts made by Ex-Cell-O or finished on Ex-Cell-O precision machines. Such wide acceptance speaks well for Ex-Cell-O quality.

Ex-Cell-O has complete parts production facilities, including rough and finish machining, heat treating, and metallurgical control, all done directly under one responsible management. All these facilities are being utilized by the aircraft industry in its rapid progress in commercial and military air power.

Below: Some typical precision aircraft parts manufactured by Ex-Cell-O to customers' specifications.

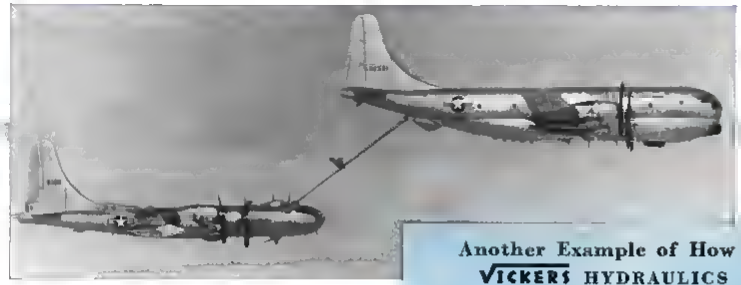
EX-CELL-O CORPORATION Detroit 32, Michigan

Boeing Aerial Tanker delivers fuel twice as fast with weight saving of 550 lb.

•

Uses New Refueling Pump driven by

VICKERS HYDRAULIC MOTOR



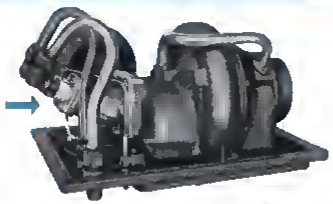
Another Example of How VICKERS HYDRAULICS

1 IMPROVES PERFORMANCE

2 SAVES WEIGHT AND SPACE

A significant advancement in in-flight refueling has been made possible by a new hydraulically driven fuel transfer pump (shown at the right). On the Boeing KC-97A Stratofreighter aerial tanker, two of these replaced 16 electrically driven pumps and deliver almost twice as much fuel per minute. The weight reduction was 550 lb. with an important saving in space. Totally submerged in the fuel tank, this new pump eliminates trouble from vapor lock . . . serious at high altitudes.

Vickers Hydraulic drives are also used for the accurate control required in guiding the fuel transfer boom. These hydraulic drives, powered from the engines, greatly reduce the tanker's electrical power requirements. Vickers builds the most complete line of hydraulic equipment for aircraft. Ask for new Bulletin A-5200.



New refueling pump, designed under supervision of US Air Forces, Air Materiel Command and built by Nash Engineering Co. Arrow points to Vickers Hydraulic Motor (Piston Type—Constant Displacement) directly coupled to pump drive-shaft. Entire unit is completely submerged in fuel tank.

4483

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

EQUIPMENT

Pesco Pressure-Loaded Hydraulic Pump

(Model No. 011227-010 01)

Performance Figures

Conditions: Fluid—AN-VVO-366B; Temperature—150 deg ±5 deg.; Altitude—Sea level

Volumetric Efficiency

At 750 psi.		At 1500 psi		At 3000 psi	
RPM	Percent	RPM	Percent	RPM	Percent
1000	97	1000	93 5	1000	83 5
1500	98 5	1500	96 2	1500	89
3000	99 8	3000	97 5	3000	97 5

Torque Efficiency

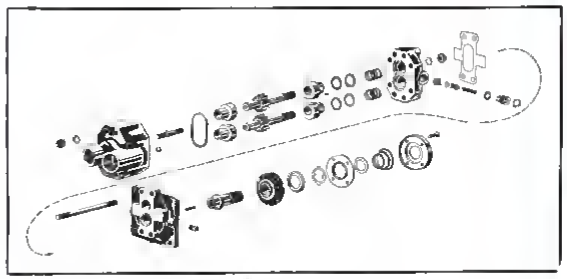
At 750 psi		At 1500 psi		At 3000 psi	
RPM	Percent	RPM	Percent	RPM	Percent
1000	97 5	1000	93	1000	88 9
1500	97 5	1500	95 5	1500	93
3000	87 5	3000	90 5	3000	90 2

Power Input

At 750 psi		At 1500 psi		At 3000 psi	
RPM	HP	RPM	HP	RPM	HP
1000	1 1	1000	2 2	1000	5 1
1500	1 7	1500	3 3	1500	7
3000	3 7	3000	7 2	3000	14 4

Capacity

At 750 psi		At 1500 psi.		At 3000 psi	
RPM	GPM	RPM	GPM	RPM	GPM
1000	2 4	1000	2 3	1000	2 1
1500	3 8	1500	3 6	1500	3 4
3000	7 6	3000	7 3	3000	7 3



PESCO DESIGN shown in exploded view. For view of assembled pump, see page 57.

Pressure Pumps Proved in Use

High pressure, gear type hydraulic pumps are gaining recognition among U. S. and foreign airlines.

Eastern Air Lines told AVIATION WEEK that it has installed two pressure-loaded, 3000 psi., gear type pumps as the power source in the main hydraulic system of two DC-4s. The carrier reported that it had experienced no trouble whatsoever with the units, manufactured by Pesco division, Borg Warner Corp. The same comment was made about two Vickers wafer kits EAL was service testing on two other DC-4s (AVIATION WEEK, Feb. 19).

L. A. Gray, Canadian Pacific Air Lines' general superintendent-engineering, reports that Pesco pumps are giving "very satisfactory service." He said current overhaul period is 1800 hr.

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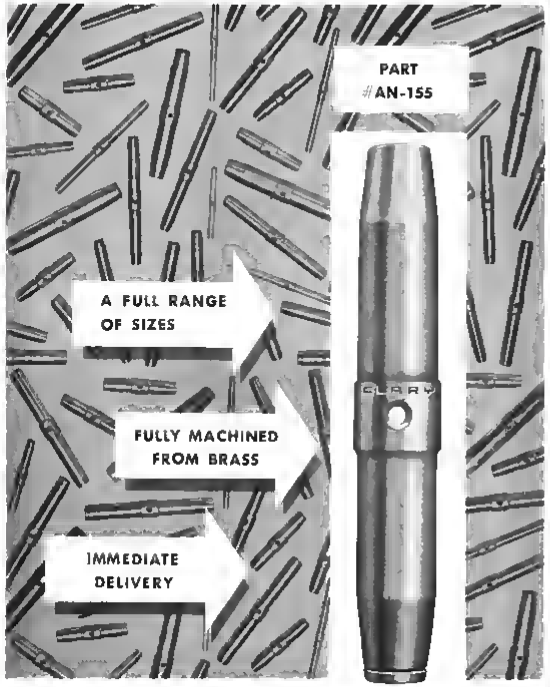

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During 1950 the units operated 3167 hr per failure.

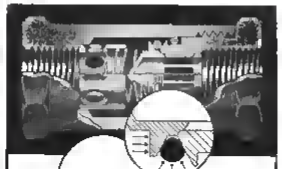
The Bedford, Ohio, concern reports that large displacement units used in the Convair 240 cabin supercharger drive system have operated 2000 hr (under constant load) requiring only recalibration at engine overhaul.

Further, it says that six smaller units have been undergoing service tests on United Air Lines DC-6s for over a year. Several "... have operated well in excess of 3000 hr with no maintenance except recalibration and replacement of rubber seal diaphragms."

▶ **Latest Wrinkles**—Culminating a long development period, Pesco says the new pressure loaded gear pump operates with optimum volumetric and mechanical efficiencies.

Highlights of the pump's design contributing to its volumetric efficiency:

- Pressure loading the movable pair of the two sets of pump bearings by metering oil from the pump's high pressure area to back of the movable bearings. This maintains the pressure needed between running surfaces of the gears on the bearings yet allows only the clearance required for a lubricating film without any appreciable leakage.
- Trapping grooves, provided on the faces of one pair of bearings, releases high pressure peaks generated as gear teeth swing to the fully-bottomed posi



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Temperatures −65° F to 280° F

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fuel valves that operate at 500 psi

Another first by Hydro-Aire! Plug type fuel and oil valves that withstand pressures of over 500 psi ... 400 psi over accepted maximums. Perhaps the basic principles in this latest Hydro-Aire achievement can be adapted to solve some of your problems in the fields of aviation fuel and pressure control.

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EVERY FIGHTER
EVERY TRANSPORT
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Getting a line on a Tin Fish...

This P5M-1 Marlin heavy engine mount made of OSTUCO Aircraft Tubing adds needed strength without increasing weight. This is only one of the many applications of versatile OSTUCO Tubing in the aircraft industry

This P5M-1 Marlin is designed to patrol our sea lanes and keep them open . . . to provide no rest for undersea raiders. Unfriendly subs are bound to get hooked . . . and stay hooked! Manufactured by The Glenn L. Martin Company, this newest anti-submarine flying boat for the U. S. Navy is another excellent example of OSTUCO Aircraft Tubing "in action."

For OSTUCO Aircraft Tubing provides inherent strength-without-weight advantages plus specialized forming and machining qualities . . . making best material obtainable for fuel lines, engine mounts landing gears, and other applications. It meets the most exacting Army, Navy, and AMS specifications.

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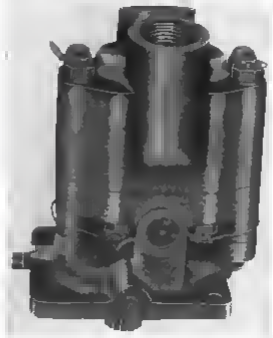

Pesco's pressure-loaded pump

tion between ports. According to Pesco, "this extreme pressure would result in high pulsations were it not for its transfer to the pressure port where the release of its energy adds to the efficiency of the pump."

Bendix Pressure Eye Oscilloscope calibrations on pumps designed for the hydraulic systems of the DC-4, DC-6, Convair 240 and Martin 4-O-4 aircraft show the maximum pulsation range to be 20-40 psi. Measurements were taken at the outlet, at any operating speed

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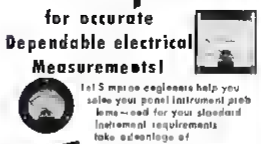

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and at pressures that range up to 1000 psi

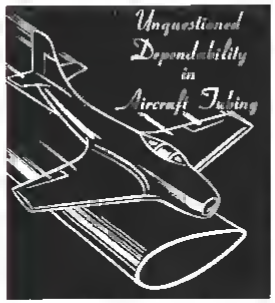
High mechanical efficiency is obtained, according to the manufacturer, by using hardened steel gear journals and faces which are ground to 4 micro in maximum and run against well-lubricated silver surfaces treated with lead indium

▶**Silent Pump**—Pesco reports that the noise generated by the pump cannot be heard over the engine when hydraulic system components are operated. This, they say, means that hydraulic noise filters, now installed on many planes, may be eliminated, saving their weight and maintenance.

The unit is light and compact. It weighs 7½ lb. and its envelop size is approximately 5 in. in diameter and 5 13/16 in. long from mounting pad to inlet and outlet ports. Total displacement is .577 cubic in. and capacity at 1500 rpm. and 3000 psi. is 3.4 gpm.

The model 011227-010-01 is standard equipment on Canadair DC-4Ms operated by British Overseas Airways Corp. and Canadian Pacific Air Lines, according to the manufacturer, who says that the airlines are aiming for a 3000 hr. overhaul period.

Pesco's overhaul instructions are as follows: The pumps should be tested at engine change periods and overhauled if the capacity is lower than,



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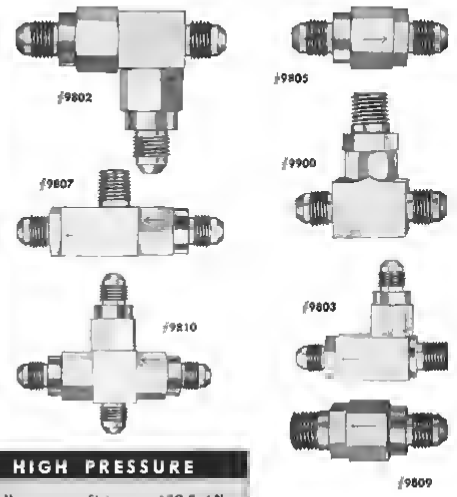

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AN No.	Style	ARO Part No.
6014-1	A	9395
6015-2	B	9812
6016-2	C	9814
6017-1	D	9816
6018-1	E	9755

LOW PRESSURE

AN No.	Style	ARO Part No.
6030-1	A	9805
6031-1	B	9809
6032-1	C	9807
6033-1	D	9802
6034-1	E	9810
6036-1	G	9803
6037-1	H	9900

Now—a complete line of *precision-made* oxygen check valves developed by Aro in accordance with AN drawings and Performance Specifications AN-V-13a and AN-V-15a.

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The Consolidated-Vultee B-36, world's largest bomber, can carry a heavier load of bombs for a greater distance at a higher altitude than any other aircraft in existence.

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SWEDLOW was selected to produce the laminated acrylic enclosures for the B-36 because of a 15-year record of leadership in acrylic fabrication, specializing in aircraft applications for the Air Force and Navy of the United States.

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Manufacturers like Boeing find Aerotec Pressure Switches built to exacting specifications for aircraft such as the B47 Stratojet, where performance qualifications are most demanding.

Now in production, Aerotec M-818 is vibration resistant up to 500 cps with 10 g's acceleration. It is capable of withstanding surge pressure of 120 psi, without change in setting. Rated for 28 volts DC, 3 amperes inductive, up to 45,000 feet.

All M800 series Aerotec switches are available for use with nitric acid, liquid oxygen, water, alcohol, octane and hydraulic fluids.

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or the torque higher than these figures:

- **Rpm:** 1400
- **Discharge Pressure:** 3000 psi
- **Inlet suction:** 12 in. Hg
- **Minimum capacity:** 2.25 gpm
- **Maximum torque:** 29 ft /lb.

PAA Orders Safety Seats for DC-6Bs

Special safety seats have been ordered by Pan American World Airways for installation in the 18 DC 6Bs now under order at Douglas.

The seats, which may be reclined to the sleeperette position, incorporate these features:

- **Stressed** to withstand loads up to 10Gs.
- **Shock-absorbing** sheet metal crash plate, shaped to body contour, is built into the back of each seat.
- **New method of installation** on tracks will make it possible to convert plane's seating capacity in a few hours for de luxe sleeperette, standard flight or low cost tourist run.
- **Cushioning** will be foam rubber, covered with nylon fabric.

Designed by the Thermix Corp., Greenwich, Conn., to PAA's specifications, the seats will be manufactured by Aerotherm Corp., Banton, Conn.

Kidde Truck Has Many Fire Weapons

A new fire fighting crash truck capable of squirting out two tons of combined extinguishing agents a minute was recently demonstrated by Walter Kidde & Co., Belleville, N. J.

The truck carries extinguishing systems to deliver water, foam, fog and carbon dioxide. Water capacity is 1000 gal., CO_2 is carried in 12 100-lb. cylinders relayed in two banks of six each. A large foam tank also is provided.

A 360-deg.-swing turret nozzle above the cab delivers a 150-ft. stream of water, foam or fog. Two 150-ft. reels on the upper deck deliver foam or water, two others CO_2.

A transfer valve controlling delivery of an engine-driven 500-gal. pump converts delivery from parallel to series, giving large volume at normal pressure or half the volume at double the pressure. Pumping system permits water to be drawn from outside sources.

Optional auxiliary equipment includes an emergency 1500-watt portable generator for two 500-watt searchlights, one 20-ft. extension and one 12-ft. hook ladder, a 150-ft. 1½-in. CO_2 booster hose reel, a 100-ft. 2½-in. water booster hose reel; two pike poles, hand axes, crow bar, assorted nozzles and applicators.

Powered by a 162-hp. engine, the truck can speed up to 50 mph. Length is 25 ft. 6 in., width 8 ft., height 10½ ft. and weight 30,000 lb.

Kidde says that their Fire Destroyer, classified as a Class A municipal pumper, is "the first crash truck built, at the sole expense of a manufacturer, in accordance with recommendations of the National Fire Protection Assn. Committee on Aviation and Airports."

Cabin Leak Tester

A new, portable cabin leakage tester for fighter-type aircraft has been put into production according to the manufacturer, Sprague Engineering & Sales, 1144 West 135 Street, Gardena, Calif.

Labeled Model S-414, the unit measures 24 x 24 x 12 in. and weighs less than 100 lb. It contains all controls, instruments and accessories necessary to test pressurized cockpits. Capacity is 200 cfm of free air, at pressures ranging from 2.5 to 10 psi.

Tester is designed to be used with plant air. If unavailable, same unit can be furnished with gas engine or electric motor-driven blower forming a complete power package.

Higher capacity testers for larger aircraft are available in the Model S-122, S-237 and other units according to Sprague.

PRECISION FITTINGS by AVICA

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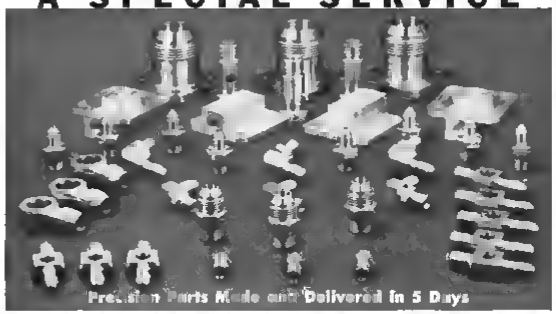

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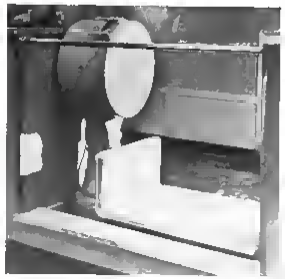
NEW AVIATION PRODUCTS



Weighs Baggage

A large, dependable scale for airline terminals, designed for fast, accurate weighing of passenger luggage is being marketed by Yale & Towne Mfg Co

Called "Flight King," the scale is a heavy duty unit built to give precision weights without requiring calibration for long periods of time. It is constructed with an eye to minimizing the possibility of scale breakdowns at critical times

Y&T believes that, with easy-to-read dials and the extra large platform, the scale will permit faster baggage handling The top plate of the unit is flanged and rounded edges help prevent damage to luggage as it is placed on the scale. The dial, available in combination metric-avordupois graduations, has an extra port so that it can be viewed by the passenger

The company says the new scale was developed at the request of several major airlines It is produced at Y&T's Philadelphia division, 11,000 Roosevelt Bldv, Philadelphia 15

Crimp Splicing

Improved, crimp type splice caps for "pigtail" splicing of electrical wires in three easy steps are the latest addition to the line of "pres-Sure-connectors" produced by the Buchanan Electrical Products Corp

The "shell-case" like caps feature open-end construction that insures wires are inserted the full length for maximum joint efficiency and insulation is butted tight against back of cap After insertion of wire, copper cap is deeply crimped at four points around its circumference to wire with special "pre-Sure-tool" crimping pliers. Excess wire projecting from end of cap then is snipped off and a snap-on insulator of required insulating value is placed over entire splice, eliminating need for taping Insulator is locked to splice by red security ring which indicates whether installation is correct

Buchanan says only two sizes of splice caps are required for all the most frequently used combinations of two or more wires ranging from two No 18s to three No 8s A single size crimping tool installs both these splice caps and also can be used to secure in one operation "Termend" lugs made by the firm for wire sizes ranging from No 16 to No 8

The company also produces crimping tools, lugs and splice caps for other wire sizes It says they are fully approved by the Underwriters Laboratories, Inc, and the Canadian Standards Assn Address: 1290 Central Ave, Hillside, N J.

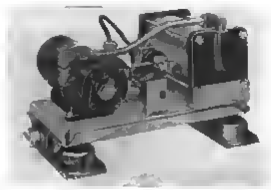
Tough Tapes

Two rugged vinyl-coated tapes, one designed for sealing packages for overseas shipment, the other to replace metal strapping at a time when metal is becoming harder to obtain have been developed by Technical Tape Corp

The sealing tape is used mainly where a stronger and more resistant material than paper is needed It can be used for sealing cans, reinforcing and sealing cartons, splicing films in chemical baths, and packaging articles for government contract The tape meets government specification JANP 127 and ANT 12-A A $1 million order for it reportedly has been received from the Army Ordnance Department

The other development is Break-Pruf" tape which is used in place of metal straps for heavy duty applications such as wrapping coils of wire, metal strips, rods, tubing, lumber and similar rough materials Break Pruf consists of paper backing reinforced with longitudinal glass fibers, giving it high tear resistance, and tensile strength

Both tapes utilize Geon polyvinyl resins, a product of the B F Goodrich Co (AVIATION WEEK Mar 12, p 43). According to Goodrich this makes them resistant to high temperature aging, greases and chemicals The vinyl-coated tapes also stand up well to abrasion and deformation, remain flexible at high and low temperatures and retain a smooth, glossy surface Technical Tape Corp's address is 277 St and Harlem River, Bronx, N. Y



Pressurizes Radar

A shock-mounted pressurizing kit which supplies oil- and moisture-free compressed air into pressurized sections of radar and other electronic parts in aircraft has been placed on the equipment counter by the Romec division of Lear Inc, Elyria, Ohio

The compact assembly will maintain sea level pressure up to 50,000 ft, Lear says It consists of a pump and motor assembly, absolute pressure switch, air filter-dehydrator unit, and an outlet check valve fixed to a single shock and vibration mount

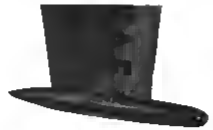
Engineers at Lear say capacity of pump, a positive displacement, rotary vane type with self-lubricating "Graphitar" blades, is well over 900 cu in /min at sea level and 80 cu in /min at 35,000 ft The continuous duty motor is rated at 27v dc, 3 amp at sea level, a maximum of 6 amp. at altitude (temperatures of −67 F.). The air filter-dehydrator is designed to function for 50 days with a relative humidity of inlet air as high as 95 percent

ALSO ON THE MARKET

Small automatic tacker, designed to cut cost of installing electrical wires, will staple braided, rubber-coated, single and double-strand wire along baseboards, plaster walls, door jambs, rafters and similar places Made by the Heller Co., 2153 N Superior Ave, Cleveland, Ohio

"Bob-cat" electric cable hoists now can be more easily serviced and adjusted with new "swing-out" transformer panel Transformer and contactors can be swung quickly to one side to give access to motor brake, eliminating need for removing bolts or disconnecting wires Made by Cleveland Chain & Mfg Co, Cleveland 5, Ohio

"Rub-R-Vive" plasticizer for office and factory will add life to rubber parts and surfaces which have hardened, cracked and become inelastic with age, says maker, Schwartz Chemical Co., Inc, 326 W 70 St, New York 23, N Y



To speed delivery, Northrop builds Scorpions by longitudinal halves, right up to final assembly. This "on-the-half-shell" production technique permits free installation of equipment in wings, fuselage, tail, and nose.

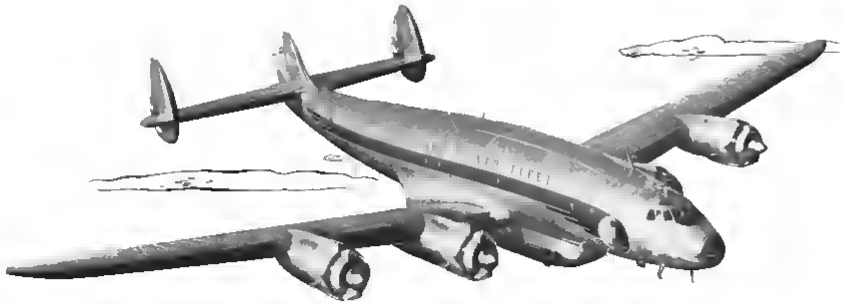
Split Scorpions Hatch Faster!

Manufacturing ingenuity at Northrop results in consistent high production marks. The Scorpion F-89, newest Air Force all-weather interceptor, is fast and deadly—with electronic search equipment and heavy armament. It is a modern successor to the famous P-61 Black Widows, built by the hundreds at Northrop during World War II.

Northrop *Pioneer*

Aircroft, Inc., Hawthorne, Californio

Builders of Night and All-Weather Fighters



THE LOCKHEED CONSTELLATION

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WORLD'S LARGEST PRODUCER OF READY-TO-INSTALL POWER PACKAGES FOR AIRPLANES

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better! faster! cheaper!

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in Chula Vista California — 9 miles from San Diego

Three Named as Air Mobilization Heads

Bigger aviation role is expected to result from new personnel shifts.

By F Lee Moore

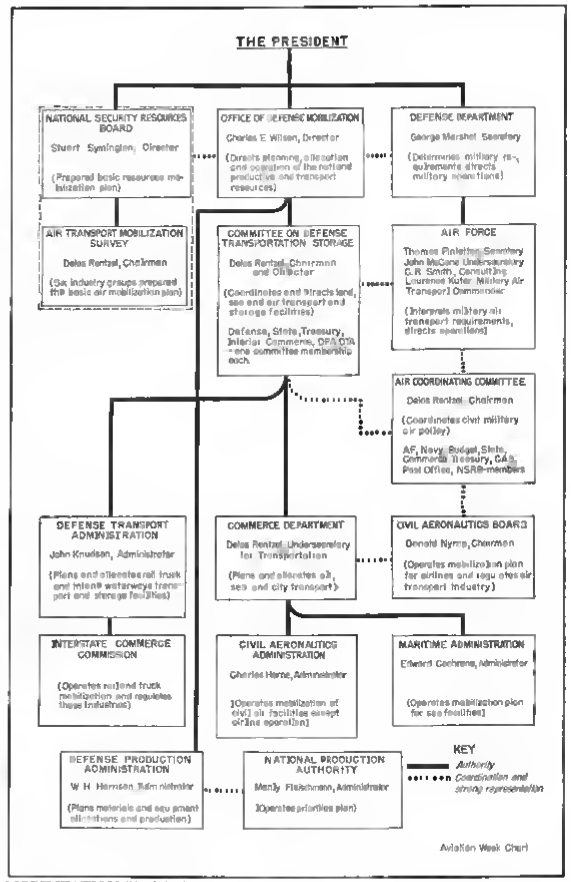
President Truman last week put the missing parts into the land, sea and air transport mobilization structure when he nominated three key men to top government jobs in air transport

Assuming Senate confirmation, considered sure by Washington observers, Delos W. Rentzel now stands atop the structure as czar of land, sea and air transport mobilization He gets this top spot by a double appointment—one as Commerce Undersecretary for Transportation and the other as key director of Defense Mobilizer C E Wilson's newly created Committee on Defense Transportation and Storage

Following CAB Chairman Rentzel's double step up, two of his closest associates also take one step up as Truman nominates CAA Administrator Donald W. Nyrop as Chairman of the CAB, and CAA Federal Airways Director Charles F. Horne as Administrator of CAA

Now transport mobilization will work this way· As Wilson's transport boss, Rentzel has two transport offices under him, covering planning and allocation of all transport mobilization facilities One is his own new Commerce Undersecretaryship that mobilizes sea and air, and the other is John Knudson's Defense Transport Administration that mobilizes rail, truck and inland waterway transport and storage facilities

The new set up appears to give the air transport industry more influence in government than it had before As chairman of the Defense Transportation Committee, Rentzel is really the boss, as the committee is non-voting Rentzel's rapid rise to power indicates he is a strong man in the administration And Rentzel appears to be working for a stronger air transport industry as a military airlift reserve He is pushing a plan with Congress, the Air Force and other groups to build the industry faster by increasing subsidies to international tourist-fare travel and to all air freight carriers, promoting self sufficiency for the domestic airlines, and hastening development and installation of electronic aids to air traffic (AVIATION WEEK, Mar. 5).



MOBILIZATION PLANNING structure as it will appear after expected Senate approval of recent appointments of Rentzel, Nyrop and Horne shows how civil aviation fits in overall picture. NSRB and ATMS (in broken line) have about completed basic work

Doing most of the detailed planning and operation for Commerce Undersecretary Rentzel's mobilization plan are the three regular administrations—Civil Aeronautics Board for the airlines, Civil Aeronautics Administration for all civil air facilities except the airlines, and the Maritime Administration for ships

Doing most of DPA's work for truck and rail mobilization is the interstate commerce commission

▶**NSRB Job Done**—Director Stuart Symington's National Security Resources Board has about completed its original Truman assignment to draw the basic mobilization blueprint Now

Backed by experience gained from two world wars and close cooperation with government agencies between wars, Glidden can:

- Supply finishes to meet practically all government specifications.
- Provide thorough technical services to insure efficient, economical production.
- Assist in adjusting finishes where necessary to meet individual production requirements.

However, through this period of increasing production for defense, the Glidden organization is not in any way reducing its services to civil aviation, which has a well-recognized position of importance in this national emergency.

For quotations, or for assistance in meeting special problems, write,

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Wilson's planning and operating set-up takes over. The NSRB Air Transport Mobilization Survey, a joint civil-military industry project of which Delos Rentzel is chairman, has almost finished its work, and the new mobilization office described above take over transport mobilization and planning.

▶ **Civil-Military Coordination**—President Truman gave Wilson's Office of Defense Mobilization (ODM) control of national mobilization. As far as the national mobilization economy goes, Wilson is top man. But both ODM and Defense work together to get the most out of the country's mobilization potential. Both report to the President.

Thus, Rentzel's Committee on Defense Transportation and Storage and the Air Force cooperate to see that civil air mobilization meets military requirements to the fullest extent possible without hurting the total national effort by hamstringing civil air transport at the same time.

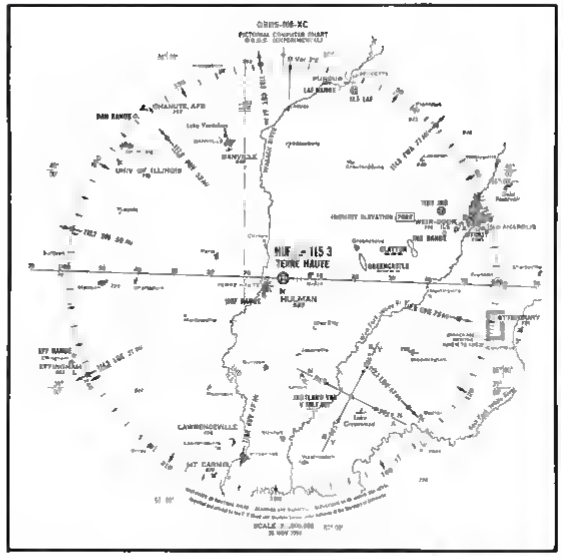
In the Air Coordinating Committee, top government air policy makers meet regularly to keep industry, civil government, and military air policy coordinated.

Equipment production—New transport equipment is allocated and given priority by another chain of mobilization offices. The Defense Production Administration does the detailed planning of materials and equipment output, expansion and allocation. Then, reporting to DPA but governed by the Commerce Department, is the National Production Authority, which operates the plans initiated by DPA.

▶ **The Triumvirate**—The Rentzel-to-Nyrop-to-Horne combination, which is taking over the three key air government posts, is a close knit triumvirate. It is understood that Rentzel picked Nyrop to succeed him when he moved from CAA Administrator to CAB Chairman, and again urged Nyrop's appointment to succeed him at CAB. Rentzel is also credited with backing Horne to follow Nyrop at CAA.

• **Nyrop** came to CAA as Rentzel's assistant shortly after Rentzel became Administrator, in August 1948, from Air Transport Assn. Nyrop had been international operations officer at ATA. He later was named Deputy Administrator in 1949, and Administrator in 1950. He is a law graduate of George Washington University, and a graduate of Deane College in Nebraska, his native state.

• **Horne** was appointed Director of the CAA Federal Airways Office, in 1949, after serving as special assistant to Rentzel. His new assignment indicates that more and more emphasis in CAA is going on radio communications, navigational aids and instrument landing systems.



STATION IS THE CENTER of new-type maps designed for Pictorial Computer

Tests to Start on Navigation Aid

Technical Development Center to fly first production type Pictorial Computer with new style charts.

The first two navigation charts of a new revolutionary series designed for the Pictorial Computer navigator were shipped into the first production type computer model last week.

Electronics Co., development contractor of the portable Pictorial Computer navigator, delivered it to the Technical Development Center at Indianapolis last week. Flight testing starts early next month. Aero hopes to sell the navigator for about $500. (For full description of the three different development models of the Pictorial Computer, see AVIATION WEEK Oct. 23.)

Pictorial Computer navigators operate on the omni-bearing distance (OBD) system—bearing from VOR, distance from DME equipment, both located at the same OBD station.

The portable model computer navigator is a small box the pilot may rest in his lap. Into the face of the box the pilot slides one of these new type charts of his area. A "bug" that holds a pencil traces the plane's present position and past track across the face of the new circular navigation chart, wherever the plane goes.

Col. John D. Kay, of the Coast and Geodetic Survey, has designed the first such map series. The first two charts of a series of seven are already published.

▶ **April Testing**—CAA Technical Development Center will have seven Pictorial Computer charts by Apr. 1. They cover two stations—Indianapolis and Terre Haute. There are three map scales for each station and a final one covering the area of both. The four scales are: 1 to 250,000 or 4 mi. to the in.; 1 to 500,000 or 8 mi. to the in.; 1 to 1,000,000 or 16 mi. to the in.; and 1 to 2,000,000 or 32 mi. to the in.

These start testing as soon as Aero's pictorial navigator is installed in the test plane, within a week or so. Since all seven test charts will have been published in a few weeks, tests will be in full swing early next month.

▶ **Revolutionary Designs**—Designing the charts for the Pictorial Computer is an entirely new job of aerial cartography. For example:

• **Station at the center.** Conventional

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Please include summary of education and experience in reply to:

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SECTION 3

NORTH AMERICAN AVIATION, INC.

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Los Angeles 45, Calif.

navigation charts focus on a state or city or airport. Col. Kay has had to design the Pictorial Computer charts from scratch, using the OBD station as center point. This is because the Pictorial Computer apparatus takes its bearing and distance from the OBD station and reproduces the same coordinates on the chart scale.

• **Letter printing.** Letter printing for these computer charts had to be designed and evaluated from new standpoints. First, the pilot will generally read these charts from farther away than standard folding charts, so letter ing for greater eye distance is needed. Also, various letter sizes and styles are tried for proper relative emphasis of identity for station, danger area, city, bearing, altitude.

• **Black and white only.** These new charts are black and white—no color. Black and white gives maximum contrast, hence greater clarity and minimum chance of error, it is also much quicker and cheaper to print.

The Pictorial Computer charts will cost about 5 cents each, individually, they will cost about 2 cents in bulk. At 2 cents a shot, the pilot can afford to record his exact track on his chart on every trip, then file it or throw it away when he lands.

▶ **Other Models Coming**—Two other more complex computer models with somewhat different chart types will be delivered this year. The chart appearance will probably be similar, but the mechanics of presentation are different.

Sperry Gyroscope Co. will deliver its development model of the Panel Pictorial Computer navigator in July. This model is somewhat more elaborate than the portable model delivered by Aero last week. The panel model is permanently mounted somewhere in the cockpit, it has a rotatable chart, so the pilot can fly 'up' the chart at all times if he wishes. The charts for this are printed on sensitized paper, a heated stylus, moving underneath the chart, draws the plane's track.

Arma Corp. delivers the development model of a console model navigator in October. This has its chart reproduced on a paper screen by projection from 35-mm. film slides inside the console.

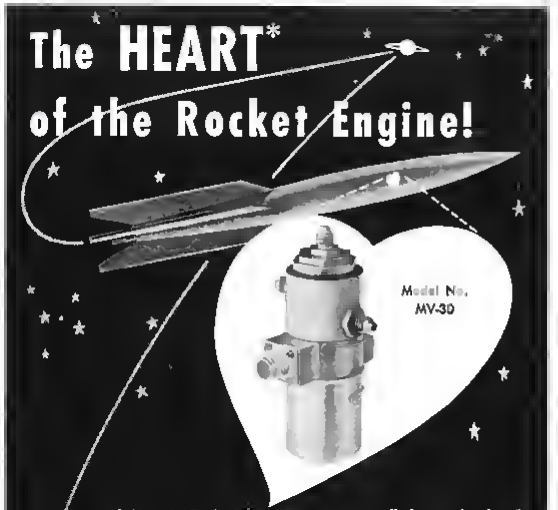
Land Agrees to Stay As ATA President

Air Transport Assn. President Emory S. Land says he will stay on in that job, as asked by ATA's board of directors.

He had submitted his resignation for the end of this year. But with executive Vice President Robert Ramspeck absent as Civil Service Commissioner during the national emergency, ATA has special need for Land to stay on as president, the directors say.

Filling in for Ramspeck in his absence will be ATA General Counsel Stuart Tipton.

The HEART* of the Rocket Engine!



* Marotta Engineering Company was called upon by the pioneers in the rocket and guided missile field to develop precision control valves.

After many years of work with these firms, a line of valves was developed which met their stringent requirements. These valves, which proved themselves in their particular applications, are now available for general use.

In addition, through continuous development, special applications are being satisfied and the efficiency of our valves is constantly being improved.

Our experience in rockets and guided missiles is available to you. Let us help you solve your valve problems.

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LAYOUT DRAFTSMEN
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With Aircraft Experience

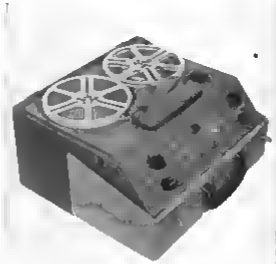
Excellent company benefits, paid vacations and opportunity to advance in a growing industry

Write, Giving Detailed Resume of Experience and Education to—

PIASECKI HELICOPTER CORP.

Morton, Pa., Near Swarthmore

CONSOLE houses 4-channel continuous radio monitor developed by Brush



PLAYBACK of radio transmissions can be stopped for analysis of any phrase.

Tape Recorder

Brush Co. unit can check 4 channels for 4 hours without tape change.

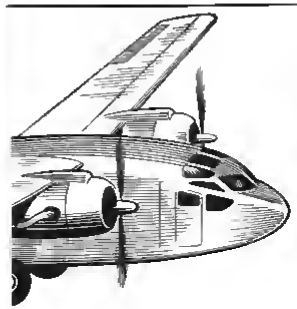
The Civil Aeronautics Administration may soon have a continuous tape recording of everything that happens on all important radio channels. This is made possible by a new multichannel aircraft communications two-way recording system designed and built by Brush Development Co.

The model designed for CAA requirements can monitor four radio frequencies for four hours before tape spools need be changed. Because the tape keeps recording even when no one is speaking on the channel all airborne radio transmissions come in on the tape. The proper time interval is preserved by this continuous recording also, so that officials may analyze just how conversations occurred.

The unit will enable ground personnel to catch mechanical faults in communications equipment, as well as to

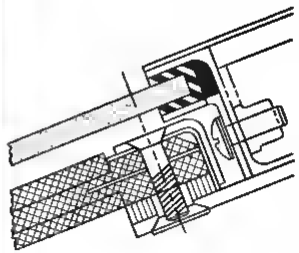
Fastener Problem of the Month

MARCH, 1951

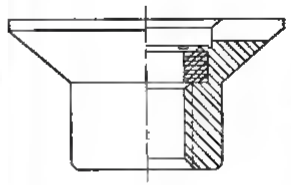


PROBLEM. In designing a new windshield assembly for the YC-122C Troop and Cargo Transport, Chase Aircraft Company discovered it had a unique fastening problem on its hands. In order to fasten laminated safety glass to metal molding, the designers needed a fastener with these three important features:

1. Self locking and vibration proof to hold glass firmly in place and to prevent leakage of windshield heating system.
2. Flush fitting to protect personnel and to provide a neat appearance.
3. Easily removable to simplify maintenance.



SOLUTION. Working with Chase designers, ESNA engineers suggested a part that met every requirement. Countersunk and screw-driver slotted, this nut, 52-1650-02, offers the self-locking features of all Elastic Stop Nuts. Incorporating the famous Red Elastic Collar, this nut provides a measured and constant grip on the panel installation—undisturbed by flight vibration.



52-1650-02

THE SUCCESS OF THIS PART in solving Chase Aircraft's problem suggests its use in other types of assemblies. For canopies or on floor and bulkhead honeycomb construction, it may provide a practical answer to current design problems. For further details on this Elastic Stop Nut, or any special or standard ESNA part, write to Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, N. J.

SPS AIRCRAFT FASTENERS

UNBRAKO

NAS INTERNAL WRENCHING AIRCRAFT BOLTS

CLOSE-TOLERANCE, HIGH STRENGTH SHEAR BOLTS — made to latest NAS Specifications. Threads are fully formed by rolling after heat treatment, an important UNBRAKO feature. Full range of standard sizes.

NAS INTERNAL WRENCHING SELF-LOCKING NUTS

meet all requirements of latest NAS Specifications. Superior safety nuts. Sizes from ¼" to 1½".

FLEXLOC

EXTERNAL WRENCHING NUTS

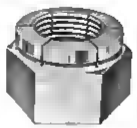
Incorporate the famous FLEXLOC self locking principle and one-piece, all-metal construction. The exceptional reliability of this construction has been proved by the millions of FLEXLOCS used in the aircraft industry.

Other outstanding advantages include:

Maximum tensile with minimum weight
Approved under latest NAS Specifications
Large bearing surface
Positive self-locking—"won't shake loose"
Temperature range to +550° F
No special tools needed—use standard 12-point socket or box wrenches. Designed for use in cramped quarters
Sizes from ¼" to 1½" NF Thread Series
Send for samples and information

ONE-PIECE SELF-LOCKING NUTS

The one-piece FLEXLOC is both a stop and a lock nut, due to its resilient segments which lock *positively*, even under extreme vibration. Torque is unusually uniform—within a few inch pounds "Thin" and "regular" types; NC and NF threads. Officially approved by many U. S. depts., bureaus, etc., and CAA for aircraft use.



Write for further information on these UNBRAKO and FLEXLOC Products.

SPS STANDARD PRESSED STEEL CO.
JENKINTOWN 3, PENNSYLVANIA

analyze procedures and specific incidents.

Brush at first tried to sell CAA its 14-channel equipment for important traffic centers (AVIATION WEEK Mar. 6, 1950, p. 35). But CAA wanted a simpler four-channel set so it might make installations more flexibly as demand arises, with one unit covering 4 channels at smaller fields and perhaps four units covering 16 channels at big centers.

A Washington test installation is giving 24-hour coverage of all sounds on Washington's four busiest channels: approach control, tower, ground control, and Air Force.

The Brush Development Co. recorder was built direct to CAA requirements, and CAA reportedly likes the test unit. So this unit may go into volume production in the near future.

The same type unit may go to Air Force airfields and combat zone commands. It enables officials to study methods of communication and also record important transmissions on several frequencies—such as those used for ground support operations, for instance.

Greek Airlines Boost Services

Three Greek airlines are boosting service starting this month over new international routes to Belgrade, Rome, Milan, and Frankfurt.

The Greek Ministry of Air has granted them permits to expand their services to foreign countries. The part British-controlled Elias Co. will operate to Rome and Milan, the TAE Co. will run Athens-Salonica-Belgrade, the AME Co. will serve Athens-Frankfurt.

Flying Tiger Expands Airfreight Service

Flying Tiger Line has now started overnight regional airfreight service linking West Coast, Middle West and East Coast cities. This is a new service added to the line's six daily transcontinental schedules.

Flying Tiger business has more than doubled in the past six months. The company is currently putting 12 more former Air Force C-46 freight planes into service, bringing its total fleet up to 37 planes.

Congressional action on separation of subsidy from air mail mail pay has been temporarily postponed.

Senate's Interstate and Foreign Commerce Committee has extended the deadline date for a report by the New York accounting firm Ernst and Ernst, from Feb. 28 to Mar. 31. The Ernst and Ernst report will outline a formula for determining what portion of mail pay amounts to subsidies to communities receiving uneconomical service. After this element of subsidy has been subtracted from mail pay, the committee plans to separate the remainder into two categories: services pay to carriers and subsidy to carriers. Studies now underway by Civil Aeronautics Board are expected to result in a formula for this breakdown.

footer: 70 AVIATION WEEK, March 26, 1951

SHORTLINES

► **Aer Lingus**—Irish airline is ordering four Vickers Viscount planes from Vickers-Armstrongs Co. at about $590,000 each. Planes have four Rolls-Royce Dart turboprop engines.

► **Air Express**—New York shipments of Air Express packages the first three weeks of February were 71 percent over a year ago to 119,401; gross revenue was up 94 percent to $544,104.

► **Acme Air Cargo**—AAC has started a new air freight service to Caracas and other Venezuelan points via New York and Miami. Company has its own customs warehouse set up in Venezuela; it speeds Caracas delivery by sending arrival notices by messenger.

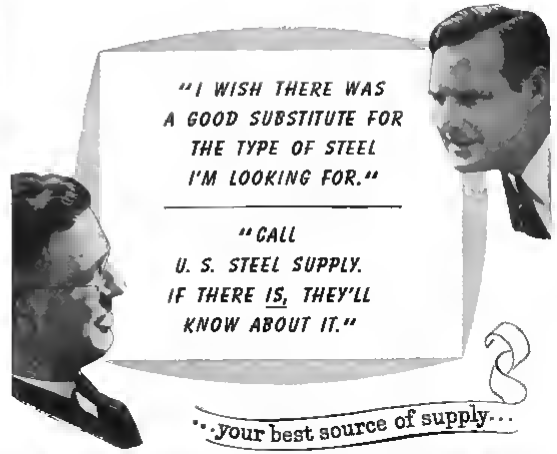
► **Air Transport Assn.**—Scheduled airlines will spend more than $8 million of a total of $16 million advertising this year on newspapers, magazines will get about $2 million, radio and television may get just under $2 million, but this budget may increase.

► **American Airlines**—AAL passenger traffic in February gained 51 percent to 298,739 passengers carried; passenger miles gained 50 percent to 154,243,476; mail ton miles, 1,164,864, were up 58 percent; express, 866,920 ton miles, are up 98 percent; freight, 3,207,918 ton miles, is up 40 percent.

► **British European Airways**—BEA will run 120 roundtrips to the Continent on summer schedules starting Apr. 16. BEA reports that in 1950 the company reduced its deficit by 37 percent by earning 8,629,497 pounds—a 28 percent gain over 1949. . . Newest fare cuts are for students and business representatives.

► **Chicago Southern Air Lines**—C&S has completed its one billionth passenger mile without a fatality in 15 years' operation.

► **Compania Dominica de Aviacion**—CDA has CAB permission to carry persons, property and mail between Dominican Republic, Miami and San Juan.



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Warehouses and Sales Offices: BALTIMORE • BOSTON
CHICAGO • CLEVELAND • LOS ANGELES • MILWAUKEE • MOLINE, ILL. • NEWARK • PITTSBURGH
PORTLAND, ORE. • SAN FRANCISCO • SEATTLE • ST. LOUIS • TWIN CITY (ST. PAUL)
Sales Offices: INDIANAPOLIS • KANSAS CITY, MO. • PHILADELPHIA • ROCKFORD, ILL.
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Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

UNITED STATES STEEL

SERVING AVIATION...
Manufacturers, Airlines and Foreign Customers

AN HARDWARE

INSTRUMENTS - ACCESSORIES
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Instruments SERVICE Accessories
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Standard Products Inc.
WHOLESALE DISTRIBUTORS FOR LEADING MANUFACTURERS
650 East Gilbert Phone 2-1431 Wichita, Kansas

footer: AVIATION WEEK, March 26, 1951 71

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS "OPPORTUNITIES" EQUIPMENT USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.50 a line, minimum 4 lines. To figure advance payment count 6 average words as a line.

Employment Wanted & Individual Selling Opportunities undisplayed advertising rate is ½ the above rates payable in advance.

Box Numbers count as one line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions

Individual Spaces with border rules for prominent display of advertisements.

The advertising rate is $13.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured "A" vertically on one column, 8 columns—80 inches—to a page.

ENGINEERS

Build your future with a young company with expanding opportunities

Immediate openings for qualified men with engineering degrees, or experience in airplane, guided missiles and helicopter engineering, particularly in

AERODYNAMICS
DESIGN
DRAWING CHECKING
ELECTRONICS
FLIGHT TEST
FLUTTER AND VIBRATION
HANDBOOK WRITING
ILLUSTRATION - TECHNICAL
SERVO MECHANISM
STRESS ANALYSIS
STRUCTURAL TEST
TOOL DESIGN
WEIGHT CONTROL
AFTERBURNER DESIGN
JET ENGINE CONTROLS
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RAMJET ENGINE DESIGN
THERMODYNAMICS

SERVICE ENGINEERS

Limited number of openings also available for mechanical engineers, engineering trainees and electronic technicians.

Top starting pay . . . rapid advancement based on individual merit . . . liberal employee benefits . . . bonus for extended work week

Send resume of training, experience, date available to

McDONNELL AIRCRAFT CORPORATION

"Home of the Banshee"

Post Office Box 516 St. Louis 3, Mo.

PILOT WANTED

by leading manufacturer of electrical distribution equipment—location Mid West—for executive DC-3 transport. Must have extensive DC-3 experience. Submit comprehensive resume including DC-3 night and instrument time. Excellent position. Send replies to

P-9175, Aviation Week
520 N. Michigan Ave., Chicago 11, Ill.

WANTED:
Communications Supervisor

Pacific airline background capable of full charge operations communications program and electronics research and development for small airline.

P-9173, Aviation Week
68 Post St. San Francisco 4 Calif.

NEED HELP WITH ELECTRONIC UNITS?

Established Eastern avionic company wants production sub contracts. Investigate this company today. It offers engineering, production, established source of supply and "Know-how" in the airborne radio field

CWW-9201, Aviation Week
330 W. 42 St., New York 18, N. Y.

SEARCHLIGHT SECTION CONTINUED ON PAGE 75

Company has operated in the republic since 1944

▶ **Idlewild**—New York Port Authority will spend $675,000 for expansion and improvement at New York International Airport. Major projects: more terminal building construction, changed roadways, and utilities, access road and parking area for the new permanent control tower

▶ **KLM Royal Dutch Airlines**—A KLM Constellation has set a commercial speed record Shannon, Ireland to Idlewild, New York—10 hr 25 min. Tail wind averaged 23 mph. Plane carried 19 passengers, 10 crew, 3000 lb cargo. Speed averaged 300 mph.

▶ **National Airlines**—February was NAL's best month yet, with passenger revenue up 59 percent to $2,407,316, passenger miles up 61 percent to 42,293,742. Number of passengers carried was up 52 percent to 65,073. March volume is running ahead of February

▶ **Pan American World Airways**—PAA in February flew 2225 passengers Seattle-Alaska—a gain of 15 percent over last year. . . . PAA has replaced DC-4s by Stratocruiser service on U. S.-West Coast-Sydney, Australia route

▶ **Philippine Air Lines**—DC-6 sleeper equipment put on Carrier's Manila-Tokyo run last week reduces scheduled time by 3 hr 46 min. from the previous DC-4 time of 11 hr 35 min. . . . Philippine is asking CAB to permit direct Honolulu-Tokyo flights without the present stop at Manila

▶ **Pioneer Air Lines**—PAL reports a 57 percent gain in passenger traffic for January and February—24,834 passengers carried. Passenger miles are up 87 percent to 8,248,227

▶ **Southern Airways**—Southern's February load factor was 24 percent—with 5697 passengers carried. . . . Southern recently got approval of a long-term $370,000 RFC loan for expansion and improvement of physical facilities and operations

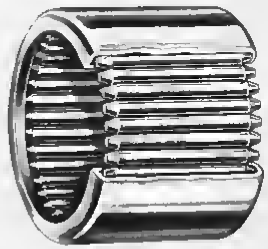
▶ **Trans World Airlines**—TWA next month starts the first all-sleeper plane service across the North Atlantic. This is the de luxe "Ambassador" service—11½ hr. to London, 12½ hr. to Paris. TWA Connies are fitted with 18 berths, some of which may be reserved for two persons. Interiors of the sleeper planes have been redecorated. Premium fare is $10 for the de luxe service and $25 for the berth. . . . TWA has failed to get CAB permission to carry Azores-U. S. traffic competitive with established Pan American service

...needs little care

Torrington Needle Bearings require a minimum of maintenance . . . operate smoothly and efficiently for long periods without attention.

Lubricant is effectively retained by the turned-in lips of the outer shell, which also help to seal out dust, moisture and other foreign matter. An even film of grease or oil is spread over all bearing contact surfaces by the full complement of small diameter rollers.

In many cases, Needle Bearings can be lubricated for life at installation. Our engineers will be glad to help reduce your maintenance problems with Torrington Needle Bearings.

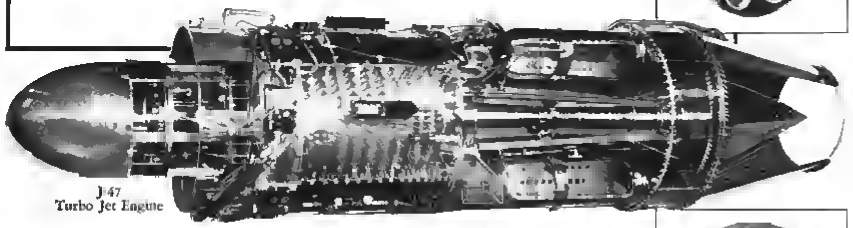


THE TORRINGTON COMPANY
Torrington, Conn. • South Bend 21, Ind.
District Offices and Distributors in Principal Cities of United States and Canada

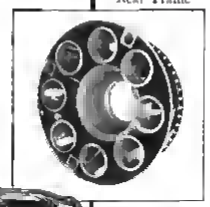
TORRINGTON *NEEDLE* **BEARINGS**

NEEDLE · SPHERICAL ROLLER · TAPERED ROLLER · STRAIGHT ROLLER · BALL · NEEDLE ROLLERS

JET ENGINES and COMPONENTS by FAIRCHILD



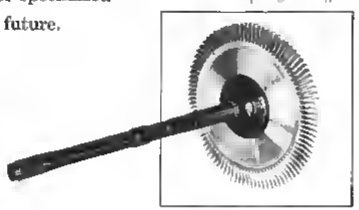
J-47 Turbo Jet Engine



Rear Frame

Forward Frame

Nozzle Diaphragm Ring



Complete Turbine Wheel Assembly

The Fairchild Engine Division is designing, and producing specialized turbine engines—some of them for unconventional applications—and is mass producing such vital components of General Electric's J-47 engine as the turbine wheel and shaft, nozzle diaphragm, and the forward and rear compressor frames—main supporting structures of the engine.

Geared to the exacting requirements of aircraft engine production, Fairchild is able to meet the expanding demands of the military establishments and take its place in the rearmament program; producing in volume urgently needed components and pressing forward the development of turbine and reciprocating engines for specialized application in the military equipment of the future.

ENGINE AND AIRPLANE CORPORATION
FAIRCHILD
Engine Division
FARMINGDALE, N. Y.

Other Divisions: Fairchild Aircraft Division, Hagerstown, Md. • Fairchild Guided Missiles Division • Air Film Division • Stratos Division, Farmingdale, N.Y.

AVIATION CALENDAR

Apr. 7-8—Tenth annual Holiday on Wings personal flyers excursion flight to Coronado, Calif., sponsored by Los Angeles Junior Chamber of Commerce

Apr. 16-18—Society of Automotive Engineers aeronautic and aircraft engine display, Hotel Statler, New York

Apr. 19-21—Airport Operators Council annual meeting, Hotel Peabody, Memphis, Tenn.

Apr. 23-24—Semi-annual meeting of the Air Industries & Transport Assn. of Canada, Harrison Hot Springs Hotel, Harrison, British Columbia

Apr. 24—Fourth session on communications by International Civil Aviation Organization, Montreal, P. Q.

Apr. 24-26—ATA annual engineering and maintenance conference, Hotel Drake, Chicago

Apr. 26-29—1951 annual forum of the American Helicopter Society, including flight demonstrations of representative service copters, Washington, D. C. Chairman is Bartram Kelley, Bell Aircraft Corp., P. O. Box 1, Buffalo 5, N. Y.

May 12-13—Airlines Medical Directors Assn., eighth annual meeting, Hotel Shirley Savoy, Denver, Colo.

May 13-14—Airline Medical Examiners Assn. fourth annual meeting, Hotel Shirley Savoy, Denver, Colo.

May 14-16—Aero Medical Assn. 22nd annual meeting, Hotel Shirley Savoy, Denver, Colo.

May 16-18—1951 spring meeting of Society for Experimental Stress Analysis, at National Bureau of Standards and Wardman Park Hotel, Washington, D. C. Send inquiries to Dr. Edward Wenk, Jr., David Taylor Model Basin, Washington 7, D. C.

May 17-19—Annual convention of the Women's Aeronautical Assn. of the U. S., Little Rock, Ark.

June 11-15—Second annual conference on industrial research, conducted by Columbia University Dept. of Industrial Engineering, New York

June 13-16—Aviation Writers Assn. convention, Hotel Commodore, N. Y.

June 15-July 1—International aviation display, Grand Palais and Le Bourget Airport, Paris

June 18-22—Private seminar on organization and operation of company standardization work to be held by Dr. John Gaillard, Engineering Societies Bldg., New York

June 18-July 6—Three week Air Age Institute course, Parks College of Aeronautical Technology of St. Louis University, East St. Louis, Ill.

June 23—1951 British National Air Races, Hatfield Aerodrome, Hertfordshire, for light, heavy craft and jets. Entry blanks available from National Aeronautic Assn., 1025 Connecticut Ave., N.W., Washington 6. Closing date for receipt of entries is May 1.

PICTURE CREDITS

9—(Sabre fore and aft) Dante Tranquilla (Canberra) Glenn L. Martin; (B-36) Wide World; (UR-3 Razen) INP; 18—David Anderton; 28—Northrop Aircraft; 42-50—Gilfillian Brothers.

ENGINEERS

GOODYEAR AIRCRAFT

Goodyear Aircraft Corporation, one of the oldest aircraft development organizations in the field, now offers unusual opportunities to engineers, qualified through educational background and experience, in all phases of aircraft design and development.

A foremost producer of military aircraft during World War II, Goodyear Aircraft is continuing its long-range program for the development, design, and manufacture of a highly diversified line of products. In addition to currently manufacturing airplanes and airships, the company also designs and builds a number of vital components, including wheels and brakes, plastic aircraft components, guided missiles, radar, and other materiel for the defense program.

The diversification of products at Goodyear Aircraft Corporation has resulted in an unusually stable and progressive organization throughout postwar years.

You are invited to investigate these opportunities by submitting a resume of your qualifications and experience, which will be given prompt and serious consideration.

Address all correspondence to Mr. C. G. Jones, Salary Personnel Department.

GOODYEAR AIRCRAFT CORPORATION
AKRON 15, OHIO

WANTED

DC-3, DC-4, C-46—Experienced mechanics. General Aircraft, Electrical Accessory Overhaul, Propeller and Hydraulic, Accessory Overhaul. Good pay, wonderful living conditions in the Lower Rio Grande Valley on the Gulf of Mexico. Established organization with six year old repair station certificate. One and one half year backlog of work.

FRONTIER AIRMOTIVE, INC.
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Write, wire or phone

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WANTED

Positions open for qualified instrument mechanics—New Equipment—New Shop—Advise previous experience and qualifications in first letter—Replies confidential

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BENTON HARBOR, MICHIGAN

WANTED

Experienced copilot for executive airplane. Large mid-western firm. Salary based on value and ability. Must have Commercial License, Instrument Rating and considerable experience in multi-engine cross country and actual instrument work and radio operation as copilot. Prefer men with A & E Rating capable of conducting routine maintenance and periodic inspections. Other requirements: pleasant personality, neat appearance, good personal habits, well mannered, cooperative, conscientious, strong initiative, interested in work free to travel extensively, ability to carry out instructions without repeated reminders, definite desire to make his place as basis of job always well done instead of skimming through on a record of empty excuses and forgetfulness.

This is a good position and we want the best man available. Don't waste employer's time unless you can honestly fulfill these qualifications. Send complete statement of background plus a recent picture in first letter.

P-9284, Aviation Week
520 N. Michigan Ave., Chicago 11, Ill.

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California Calling engineers

There's a better life waiting for you and your family in Southern California—at Lockheed. Here, in beautiful, sun-swept San Fernando Valley, you find living and working conditions beyond compare

So why not enjoy both your work and your life in Southern California? Lockheed's long-range production program has created many new openings Engineers are needed immediately on commercial and military aircraft

What's more, higher salary rates are now in effect Lockheed also offers generous travel allowances to those who qualify Full pay if additional training necessary

Positions now open include:

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Production Design Engineers
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Employment Manager Plant #-1
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offers you unusual opportunities to secure your future with a young and growing organization Long range program developing and producing new types of helicopters for the military services

Excellent suburban working and living conditions Compensation for extended work week Top rated educational, cultural and recreational facilities

- ROTOR DESIGNERS
- POWER TRANSMISSION DESIGNERS
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- AIRFRAME DESIGNERS
- ROTOR STRESS ENGINEERS
- LOFTSMEN
- DRAFTSMEN
- PRODUCTION PLANNERS
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Send detailed resume to

PERSONNEL MANAGER
THE KAMAN AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT

Openings for

ENGINEERS

in

CALIFORNIA

Positions now available for experienced aircraft engineers

ELECTRONIC SPECIALISTS
RADAR TECHNICIANS
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AIRCRAFT DESIGN ENGINEERS
STRESS ENGINEERS
DRAFTSMEN

SPECIALISTS IN AIRCRAFT ENGINE EXHAUST SYSTEM DEVELOPMENT

with background in
Thermodynamics and Combustion
Send resume of experience and technical training to
Director of Engineering

RYAN AERONAUTICAL COMPANY
108 Lindbergh Field
SAN DIEGO, CALIFORNIA

REPLIES (Box No.) Address to office nearest you
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CHICAGO 520 N. Michigan Ave. (11)
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POSITIONS WANTED

EXPERIENCED EXECUTIVE Pilot, Commercial S&MEL Instrument Ratings, desires employment. Immediately available. Experienced DC-3 Lodestar Twin Beech C-54, C-46 etc. Preferably Gulf Southwest or Far West Areas. Age 36 Write P.W.-3168, Aviation Week.

SERVICE ENGINEER—seeks position Power Plant or Airframe Fields—Many years experience in Customer Service—Also Military equipment P.W. 3178 Aviation Week.

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MANUFACTURER'S REPRESENTATIVE Successful and dependable sales executive with long experience and wide contacts in aircraft and related Science Industries, including military establishments, available immediately to handle one or more manufacturers' accounts on eastern seaboard or national territory. Glad to give further details and unquestionable concrete references. Invite information about your product and arrangements in confidence RA-3186 Aviation Week.

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Beech C18S Twin Beech
In country New gear tanks, cities tubes internal for wheel gear modification completed P&W engines 110 hrs. SMOH. Call or wire Jim Gray Elmhurst 3345 P. O. Box 7333, Dallas, Texas.

Model 35 Bonanza—
624 hrs. TT very clean, full panel $6000. Call or wire Jim Gray Elmhurst 3345 P. O. Box 7333 Dallas Texas.

Two—Model A35 Bonanzas—
one with 210 hrs. TT league and engine Mitchell Omni The other 1040 hrs. TT on frame with 40 hrs. on engine SMOH Priced for quick sale. Call or wire Jim Gray Elmhurst 3345 P. O. Box 7333 Dallas Texas

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Wanted—BTs
with P & W R985 engines only Will pay highest market price whether you have one or hundred either flyable or non flyable. Write wire, phone Cities 1 3126 Carl Turner 1007 Airway Glendale California.

Wanted: P & W R1830 AN1
engines engine parts accessories. AT-6 propellers, blades or airframe parts. Will take any quantity paying good price. Write wire, phone Citrus 1 3125 Carl Turner 1007 Airway Glendale California

AC SPARK PLUG DIVISION
of
GENERAL MOTORS CORPORATION

PRECISION INSTRUMENT PLANT

Positions now available for highest caliber personnel in the field of airborne automatic electromechanical control equipment

MECHANICAL DESIGN ENGINEERS
ELECTRONIC ENGINEERS
SERVO ENGINEERS
JUNIOR ENGINEERS

New and expanding division of an established firm with 20 years of successful experience in the instrument field Work involved deals with the manufacture and development of highly complex equipment of the most advanced type

Write or Apply

AC Spark Plug Division
GENERAL MOTORS CORPORATION
1925 E. Kenilworth Place
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ENGINEERS

Career Positions for Qualified Men

in

Baltimore, Maryland

AERODYNAMICS . . . . STRUCTURES

B S. or M.S. degree and at least one year experience.

HEATING AND VENTILATING ENGINEERS

Engineering degree—minimum of 4 years experience in aircraft cabin conditioning, pressurization and refrigeration. Knowledge of gas dynamics and heat transfer.

POWER PLANT ENGINEERS—JET

Minimum 3 years experience in turbo-jet aircraft installation, with emphasis on cooling and induction systems. Background in thermo and gas dynamics and heat transfer.

POWER PLANT ENGINEERS—LIQUID ROCKET

3 years or more experience in liquid rocket motor installation, with emphasis on gas feed and pressurization systems.

These are permanent positions in a critical industry.

No Housing Problem

Submit complete resume to:

THE GLENN L. MARTIN COMPANY
EMPLOYMENT DEPARTMENT BALTIMORE 3, MARYLAND

COORDINATION ENGINEER

Responsible for the establishment of systems and administrative control procedures designed to coordinate the overall activities of an expanding engineering organization. Extensive experience in aircraft engineering practices required

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To assume responsibility for the overall planning and scheduling of engineering projects through design and development phases. Applicants must have extensive experience in aircraft engineering and experimental planning operations

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Required to install and maintain a records system for all tracings, reference prints, engineering orders and related records Applicants should have extensive experience in aircraft engineering records and procedures.

Send detailed resume to

PERSONNEL MANAGER
THE KAMAN AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT

AERODYNAMICISTS

Project Leaders: 5 to 10 years experience in handling qualities evaluation of all types of aircraft.

(Also aerodynamicists with 2 to 4 years experience in stability and control.)

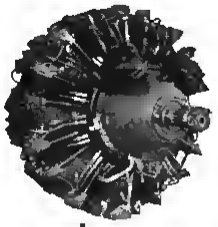
GRADUATE ENGINEERS

FOR ENGINE ANALYSIS

Project Leaders: 5 to 10 years experience in analysis of performance of aircraft engines (Reciprocating and/or Turbojet).

(***Also engineers*** with 3 to 5 years experience in engine performance.)

CURTISS-WRIGHT CORP.
ELECTRONICS DIVISION
CALDWELL TOWNSHIP, NEW JERSEY



R-2800's 31S-51S-75S

price $3000.00

These engines are 00:00 time since factory new and have had ACES C.A.A. approved outside in lubrication system blower to thrust plates incorporated. They have also been block tested in our modern test cells and have been prepared for long term storage.

C.A.A. Overhauled $2,5RO.RR

C.A.A. APPROVED OVERNAULS

P & W 1830-92 without exchange $2,500.00
Above with exchange $2,200.00

All Engines Complete with Form 60-8
ALL WORK AND ENGINE SALES CARRY OUR 100 hr WARRANTY

AIR CARRIER ENGINE SERVICE, Inc.

C.A.A. Approved Repair Station No. 3604
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Cable "ACENGSER"

ACES — Aviation Engine Service

AIRPLANES

"Finest Quality Executive and Transport Aircraft"

GRUMANN "WIDGEON"—Low Time—$9,500

PBY-5A—Licensed, New Fabric, Mod Tail—**$28,500**

BEECN-C18S—Excellent Executive Ship—**$35,DDD**

—Will Accept BONANZA or NAVION in Trade—

—ABOVE AIRPLANES ALSO AVAILABLE FOR LEASE—

ENGINES–ACCESSORIES–PARTS–SUPPLIES

CENTRAL PURCHASING AGENCY, INC.

Located At Hangar #1 · International Airport

Write P. O. Box 126, International Airport Branch

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A Complete Line of New and Used Electronics Equipment

DAVE RUMPH CO

DAVE RUMPH Co.

"Aviation's Leading Electronics Supply House"

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11 Words & Tax

AVAILABLE FOR IMMEDIATE SHIPMENT FROM STOCK

TYPE N.A.F. AMMETERS & VOLTMETERS

Replacements & Spares for Existing Aircraft

N.A.F.-1091 METERS

C-30	R-17-A-5728	30 Amp
D-30	R-17-A 5748	30-0-30 Amp
C-60	R-17-A-5725	60 Amp
D-60	R-17-A 5745	60-0-60 Amp
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D-120	R-17-A 5758	120-0-120 Amp
C-240	R-17-A-5735	240 Amp
D-240		300-0-300 Amp
A-30	R-17-V-778	30 Volt 30 Amp
B-60		60 Volt 60 Amp
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OTHER AIRCRAFT INSTRUMENTS

D-2 Ammeter 0-17-A-6730 20-0-180 Amp
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TYPE N.A.F & OTHER SHUNTS

30 Amp NAF-1001 150 Amp % 94-32204
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120 Amp NAF-1001 300 Amp MSD 201

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We own and offer for immediate delivery from our Baltimore Warehouse

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Pieces	Part No.	Diameter	Valve No.
30	UA-3150	5 inches	U3250
29	UA-3160	6 "	U3250
95	UA-3160C	6 "	U2061-4
73	UA-6007-CF-DV5	7 "	UA3265
14	UA-6009-S-30	9 "	UB3250-30
11	UA-6012K-S30K	12 "	UB3250-30

NARRISON RADIATOR DIV.

5	8503220	14 inches	
4	8503274	12 "	8504081
32	8503361	14 "	8503113
34	8503429	14 "	8504092
28	8503443	13 "	8503469
26	8503470	13 "	
6	8503800	14 "	8504093
36	8504481	13 "	
11	8504490	12 "	
17	8504491	14 "	8504092
188	8504709	13 "	8503430
399	8504985	14 "	8505334
8	8505153	14 "	
40	8505333	14 "	
32	8505414	13 "	8505071
9	8505420	13 "	
157	8505568	14 "	8504666
103	8505570	13 "	8505571
111	8505660	14 "	8503113
93	8505661	14 "	
207	8505991	14 "	8505992

SPECIAL VALVES

243 8504938-DV3A
87 8505268
20 8505270

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44 AN4103-2 Cooler Type DV95L Width 18" Depth 9¼" Valve U4785-2

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★ *Send us your material lists for screening!*

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Telephone: Curtis 3300

One of America's largest stocks of UNUSED

AIRCRAFT PARTS

We own and offer all parts listed—plus many thousands more—stocked in our Baltimore warehouse!

PRATT & WNITNEY AIRCRAFT ENGINE PARTS

Quantity	Part No.	Description
188	1045A	Bearing
500	3500	Flange
28	5903A	Bearing
130	8988	Follower Assy
87953	8427	Screw
30	9030	Bolt
1874	10759	Bolt
1300	11217	Cover
100	11769	Guide
7	80456-8	Bearing
1157	35707-5	Bushing
8174	35787-10	Bushing
39	35897 8	Stud
814	35814	Blower Assy
3007	35817	Spring
900	35855	Cap
5446	35924	Washers
4200	35938	Gasket
8	37751	Cover
15	37933	Housing Stud
28	38314	Rod Assy. Comp
20	45813	Cover
128	48-600E	Liner
30	48346	Cylinder
1	48347	Cylinder
1470	48360	Bearing
88	48368	Shaft
178	48383	Shaft
8	48388	Sump
100	48388	Fitting
209	48390	Retainer
98	48398	Sump
583	48447	Bushing
107	48457	Adapter
76	48458	Bushing
390	48461	Gear
149	48468	Bearing
90	48468B	Bearing
389	48469	Bearing
470	48470	Bearing
75000	51500	Plug
395	54847	Clamp
71	90781	Cover
71	57906	Cover
10	98975	Gear
18	68837	Clamp

PRATT & WNITNEY AIRCRAFT ENGINE PARTS

Quantity	Part No.	Description
70	76938	Gear
5	77433	Housing (Reduction)
565	81397	Tube
100	84183	C/Case Assy
10736	84185	Cover Assy
881	84835	Pipe
155	84881	Spacers
1351	84988	Adapter
18	84884	Adapter
1178	84889	Bearing
81	84314	Counter Balance
113	84407	Housing
87	84567-R	Stud
77	84581C	Nose Housing
178	84602	Bracket
951	84687	Pinion
39	84709	Shroud
397	84758	Bearing

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ELECTRONIC COMPONENTS

Pieces	Part No.	Description
35	RA-10-DD	Receiver
90	TA12B	Transmitter
150	DA 1F	Dynamotor
162	3611 0	Amplifier
15	MR-9B	Control Box
7	ASETA/ARN 5	Antenna
9000	45	Bulb
11300	1007	Bulb
1000	987	Bulb
300	AN3135 1	Bulb
87	M916D	Filter
67	FT213	Mount
54	FT293	Mount
80	8X48 7	Dynamotor

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Quantity	Part No.	Description
300	D7818	Adel Anti-Icer Pump
130	8P771A	Pesco Fuel Pump
300	AN4014	Type D3 Wobble Pump
530	564-2	Pioneer Oil Separator
115	P4CA2A	Parker Primer
80	AN3813-1	Scintilla Ignition Switch
9000	AN3096-4	Light Assembly
800	AN3096-5	Light Assembly
380	AN3096-6	Light Assembly
75	EE-709M8	Air Associates Motor Assy
1500	AN4078-1	(37D6210) Solenoid
490	AN6263-1	(AA140078) Accumulator
88	AN5531-1	G.E. Tachometer Generator
30	AN4102-1	(IFD 8100) Thompson Fuel Pump

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COCKPIT VIEWPOINT

Ice Still a Problem

The past winter (or is it still passing?) demonstrated once more that ice is still a major factor when applied to airplanes. Recent experiences focused attention on several phases of icing. First, some theories on the use of thermal de-icers for enroute icing have been revised; second, the helplessness of airfoil de-icers in combating ground ice, especially freezing rain, was illustrated; and third, a need was shown for more efficient engine intake air heaters.

When thermal wings were first introduced they were called "anti-icers" rather than "de-icers." Reason for this distinction was that wing heat was to be applied prior to encountering ice on the theory that the warm wing would remain ice free.

►**Melt and Refreeze**—Since only the leading edges of airfoils are heated the melted ice runs back and freezes. Engineering flight tests indicated that this would not be serious. However, recent trips in icing weather have refuted this theory. Pilots who have tried it find that run-back can be dangerous and have reverted to the "de-icer" method. By allowing ice to build up on the leading edge, then breaking it off in chunks by application of heat, very little run-back is incurred.

Except for this run back condition it may be claimed that thermal wing aircraft can successfully cope with most types of enroute icing.

Unfortunately this claim cannot be made for ice that accrues on the ground. There was a considerable amount of freezing rain this winter, mostly light to moderate, which caused severe disruption of air travel. Aircraft de-icing, or anti-icing systems (your choice of words) were helpless. Best, and only method was to tow planes into warm hangar, spray with hot water and apply an alcohol-glycerine solution. Time to clean a plane, about 20 minutes. Cumulative delay caused by moving departures from terminal to hangar ran considerably in excess of this.

►**Temporary, But Serious**—The grounding of airplanes by freezing rain, albeit a temporary matter, is serious. Airfoil ice is critical for all aircraft during takeoff, especially on high performance jets. Since jets are rapidly becoming the mainstay of the Air Force, and can be expected in commercial use soon, the problem is worthy of consideration. Laborious hand scraping will hardly suffice for fighters required to respond immediately to an "alert."

The inadequacy of carburetor heaters was also illustrated this winter during several periods of moderate snow when temperatures hovered around freezing. On three flights this author experienced engine ice-up while maintaining full carburetor heat of 40-50 deg. C. Use of alcohol gradually thawed out the situation but several other pilots were not so fortunate and suffered complete power loss.

The control of ice in turbine engines appears to be a more difficult matter than with reciprocating engines. It is doubtful whether turbines could have existed under certain conditions in the past several months. Since aviation appears destined to make an ever increasing use of turbine power this issue is of paramount interest.

Civil Air Regulations prohibit takeoff with ice adhering to a plane. This is a sound policy. But aviation needs a solution, not merely a prohibiting regulation. Methods must be devised whereby aircraft can de-ice themselves on the ground and be assured of ice-free powerplants when in the air.

* * *

The author was pleased to hear of numerous requests for the ATA-ALPA approach light film as a result of comment in this space (AVIATION WEEK Feb. 13). Those who wish information on the two companion subjects, lighting and marking of runways, please note:

• "Advances in Airport Lighting" (by W. S. Pennow, Westinghouse Electric Corp., Cleveland, Preprint 28) is the best work in this field to date. Mr. Pennow considers spacing of lights, candlepower, photometric distribution of light in the region of guidance and circling area as well as many other matters. The recommendations contained in this paper are sound and make good operating sense.

• Of equal worth are the specifications on runway markings evolved by the Sperry Gyroscope Corp. These plans were adapted from drawings of E. S. Calvert of the Royal Aircraft Establishment, Farnborough, England, and are complete to the point of including a formula for the marking material. This consists of 10 parts lime, 1 part bleached cement and water and is the mixture used in Canada. It is economical, has proven to possess excellent non-skid properties and is easily renewed.

For all those interested in runways these publications are reading unexcelled, for those engaged in airport work they should be reading required.

—R. C. Robson

PROFESSIONAL SERVICES—First issue of each month

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March 26, 1951

EDITORIAL

A Navy Answer on 'Saucers'

To be sure of publicizing "the other side" of a controversial question, we print in full on this page a letter from the Chief of Naval Research commenting on our recent editorial, "Saucers, Secrecy & Security." We have numbered the paragraphs of his letter to tie in our own comments below.

The letter to AVIATION WEEK follows:

Dear Mr. Wood.

I refer to your editorial in the 19 February issue of Aviation Week. If the facts which you present were correct and complete, it would be my pleasure to congratulate you on doing a real public service in exposing them.

However, I should like to point out several errors of fact, the correction of which may serve to resolve the misunderstanding concerning the Navy, "flying saucers," and Project Skyhook.

(1) You question "why official secrecy was necessary." The research on Project Skyhook has been unclassified (neither "secret," "confidential," nor "restricted") since its inception in 1947, and progress reports have been continuously and widely disseminated to all interested agencies in the three armed services.

(2) A Department of Defense general press release concerning Project Skyhook was made on March 3, 1948, accompanied by photographs of balloons being launched and in flight. Look magazine photographed a launching at Camp Riley, Minn., on 20 March 1948. During early 1949 the Saturday Evening Post, the National Geographic magazine and Popular Science assembled picture stories on Skyhook.

(3) On Sept. 7, 1950, the Chicago Tribune published Skyhook pictures (following a flight from Stagg Field at the University of Chicago) with the following caption: "That 'Saucer' You Saw Was a Skyhook."

(4) Aviation Week states that "apparently months after the ONR balloon ascensions began, neither ONR nor high Navy officials had tipped off the Air Force."

(5) An unclassified letter from the Chief of Naval Research dated 13 November 1947 describes the Skyhook research and the new, larger balloon, and invites addressees to submit proposals to "utilize the test flights of these newly developed cells for scientific purposes." The addressees of this letter include the Director of Research and Development, General Staff, U. S. Army, the Office of the Chief Signal Officer, U. S. Army, the Director of Research and Development, U. S. Air Force, the Research and Development Service, Ordnance Department, U. S. Army; and the Air Materiel Command, Wright Field, Dayton, Ohio. Skyhook was not "news" since several agencies of both the Army and the Air Force have known of Project Skyhook and its objective since its inception.

(6) Flights were made from Camp Riley, Minn. An Air Force B-17 was used in tracking. Clearance for all flights was obtained from the Civil Aeronautics Authority (apparently, the Civil Aeronautics Administration—Ed. Note). Since April and May 1949, Skyhook flights have been made from Holloman Air Force Base, Tex., and in May 1949, a joint Navy-Air Force conference was held at the Air Materiel Command, Wright Patterson Air Force Base, Dayton, when the Office of Air Research considered possible support of the Skyhook project.

(7) You congratulate Look for having "smoked out" the article. The proposal for the article came from Dr. Liddel, continuing ONR's previous efforts to publicize Skyhook as an interesting and dramatically pictorial research project. When the telescopic photographs which led the Look article were received here in November, 1950, they were submitted, with the outline of the story as it appeared, to Life Magazine. Life rejected the story and pictures because "they had no news value." Subsequently pictures and story outline were offered to Look, which accepted them.

(8) I believe these facts prove that the Navy intended to 'perpetrate' no "hoax." One may conclude only that different sections of the press are sometimes in disagreement as to what constitutes "news."

I hope that, in fairness to both the Navy and the Air Force, you will find it possible to publish the foregoing.

T. A. Solberg, Rear Admiral, USN
Chief of Naval Research
Washington, D. C.

Our own comments on Admiral Solberg's letter:

(1) The Look article quoted Dr. Liddel—"When this project first began," he said, "it was kept secret. Now there is no longer any need for secrecy on a scientific basis. And, certainly, there is no longer any need to keep the public in the dark about what flying saucers are." Look tells us this is an accurate quotation, that Dr. Liddel went over the article and that his corrections were made before Look appeared. Dr. Liddel in the approved article thus indicated the project was secret for a time. Admiral Solberg denies this. Dr. Liddel indicated the public had been kept in the dark about what saucers were, but that there was no longer any need. Admiral Solberg never comes to grips with this point in his letter.

As to progress reports to all "interested" agencies in the armed services, these apparently went mainly to research people, and apparently these reports in no way tied in the balloons with flying saucers. If they did not, any number of scientific progress reports about Skyhooks per se would not answer the world's queries about flying saucers.

(2) If the Defense Department's press release and the resulting stories and pictures were concerned only with Skyhooks per se, and did not link them to flying saucers, then the news or feature material was accepted and published on its own merit as one more scientific feature story.

(3) A newspaper headline or caption writer is no authority. He adds a label. Did ONR disclose to the Tribune that Skyhooks were Saucers and let itself be quoted accordingly?

(4) Obviously, we referred to a tip-off that Skyhooks were—or probably were—flying saucers.

(5) We refer to our comment on (1). This list, indeed, shows mainly research people. Apparently the letter did nothing to tie in Skyhook with flying saucers, nor apparently was any further letter sent out doing so at a later date when it began to appear that the balloons were probably saucers. So Skyhooks were "news" only as Skyhooks.

(6) All of this still refers to Skyhook solely as one more scientific operation.

(7) Note again that earlier efforts to "publicize Skyhook as an interesting and dramatically pictorial research project" added up to exactly that, even though a convincing and expanding file of hundreds of reports indicated ever more strongly that Skyhooks were saucers. If ONR had wanted to "publicize" Skyhooks what better way than to tell officially, through Navy public relations, that they were saucers? As to Life Magazine, we can understand why a story and pictures already released by the Defense Department would hardly be considered hot news, if ONR once again failed to identify Skyhooks as saucers.

(8) In government parlance, we "non concur." ONR may not have intended to perpetrate a hoax on the American people but it did. Why didn't it tell about its accumulating file of reports in Washington and say that workers at the General Mills aeronautical laboratories were tracing lost balloons regularly "by published reports of flying saucers ..."

As we wrote here Feb. 19: "Why was this mystery permitted to build up for three years to the extent of a world-wide mystery and even loss of life?" These questions still are not answered. —Robert H. Wood

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